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A Study of the Accomplishment of Students in High School, College and Medical School*

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The matter of the selection of students is a problem in all the medical schools of this Association. At the Albany Medical College, which enjoys the distinction of having the smallest enrollment of any of the four year medical schools of the United States, the problem is somewhat different from that of the average school. This is, in part, due to the fact that we consider our primary function to be the training of physicians for general practice in the rural districts of northeastern New York State. In 1929, we made a personal survey of the doctors already practicing in the country districts and small towns of our area. The results of this survey brought out certain very striking points, several of which I shall briefly mention.

1. Forty-two and five-tenths per cent of the physicians in rural practice in our district were graduates of our school. The second highest school had ten and four-tenths per cent.

2. Fifty-eight and nine-tenths per cent of these doctors were over 50 years of age and 24 per cent were over 60 years old. This indicates many replacements within the next ten years.

3. Sixty-nine per cent of these physicians were born and raised in the country. This means that the country boy is much more likely to be a country doctor than is the city boy.

4. Of the country bred physicians, 85.5 per cent preferred country practice. In other words, the great majority of these doctors are satisfied.

This study tended very strongly to confirm an opinion which had for some time definitely influenced the policies of the Admissions Committee; namely, that we should give preference in the selection of students to those having affiliations within our district and particularly to those born and raised in the small towns of our area. In fact, this was listed as Point I in the five point program adopted by the school in 1928.

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This policy of giving preference to the country boy or girl does not mean that his or her scholastic requirements for admission are in any way lowered. They must show evidence of having completed at least three years of college work, with grades high enough to indicate that they can succeed in medical school. They must be recommended by the authorities of their college or university. They must interview at least three members of the Admissions Committee and satisfy them as to personality and character factors. As a matter of fact, we have admitted during the past four years only two students each year with the minimum of three years of college work. These are taken from Union College and are selected by the Committee on Recommendations of that institution. This is done as an experiment to permit comparison of three year students alongside four year students from the same institution.

If I were to describe the type of applicant who makes the most favorable impression on our Admissions Committee, I would proceed as follows: He is a young man, from 21 to 24 years old, born and raised in Blankville, a small village in our district. His father is a country doctor, farmer, minister, carpenter, storekeeper, school teacher, or follower of any honest occupation. The boy's ancestry may truly be classed as American. He is a strong, healthy appearing young fellow, neatly but not flashily dressed. He is keen and alert, courteous but not fawning. He appears to have common sense. He attended his local high school and is about to graduate from an approved college. He has made an average grade of from 80 to 85 in his first three years of college. He has never had a grade below 75 in physics, chemistry or biology. He has taken part in some extra-curricular activity. He is interested in the outdoors and prefers the country as a place to live. His ambition is to be a country doctor.

When the applicant I have described has had his interview with several members of the Admissions Committee, he is barely out of the door before the committee is bombarding the dean's office to have this boy accepted before he escapes. Needless to say, applicants of this type are too few in number. Of the 428 applicants during the past year, possibly ten could, by the exercise of a little generosity, be placed in the above group. There were, of course, a number of other very acceptable applicants who could not be so classified because they were not of rural origin. They were accepted, but our survey leads us to believe that they are not likely to make country doctors.

Since this condition exists, it has seemed possible that something might be done about it. In this district, twenty counties of northeastern New York, there is a rural population estimated at about 650,000. Certainly that population should supply each year from twenty to twenty-five boys and girls having the qualifications of character, personality, industry and

intelligence necessary for the study of medicine. Granted that the boys are there, the next problem is to find them, interest them in medicine, direct them through their preliminary education and possibly lend the financial aid required in many instances.

As a start in this direction it was decided last year to make a survey of the high schools in our district. This undertaking was made possible by the cooperation of the authorities of Union College, the undergraduate department of Union University. Mr. Daniel Weeks, an instructor at Union College, was assigned to the work and visited each high school in our area. He spoke to the students of these schools about higher education and the opportunities in medicine, particularly, and invited any that were interested to confer with him afterward. This work had not progressed very far before it became apparent that there were few high school students in the rural districts with the ambition, scholastic attainment and financial backing necessary for the long and expensive training required in medicine at the present time.

The question was raised of possible financial aid for certain promising young students who were interested in medicine but lacked the money for even the preliminary college education. This raised the second question of the selection and evaluation of these students while still in high school. How could one determine whether or not this boy, selected on the basis of character and personality, would survive scholastically the four years of college and the four years of medicine? Might one not lend aid to some boy during his college course only to find him a failure in medical school?

First, we wrote to possible sources of information to find if there were any recognized methods of determining an aptitude for medicine on the part of a student while still in high school. No one would hazard a suggestion. The first and most logical thought was that the grades in high school, particularly in the sciences chemistry, biology and physics, might be an index of their aptitude for medicine, as the college grades in those subjects often are. To throw some light on this question, the following study was undertaken.

The original plan was to select 100 graduates of our school, tabulate their grades for each of the four years in medicine and compare their medical school records with their college and high school records. To make the comparison as fair as possible, it seemed necessary to select students who had all attended the same college. It also seemed advisable to limit the study to the past ten years, since during that time there had been no changes in the personnel of the department heads of our school, and very few changes in the teaching staff at Union College, which has been and still is our largest student source. The high school grades were considered to be on a fairly uniform basis, since in New York State the Board

of Regents sets the examinations in all high school subjects and grades the papers.

I was able to select 105 students all having their premedical preparation at Union College and graduates from our medical school since 1923. However, this number was, of necessity, reduced to ninety due to the fact that high school grades were not available for fifteen of the original group. In making up the averages for the four years of medicine, the following subjects were considered in the various years: First year—gross anatomy, histology, embryology, physiology and biochemistry. Second year—pathology, bacteriology, pharmacology, anatomy, clinical pathology, obstetrics and physical diagnosis. Third year—medicine, surgery, neurology, psychiatry, obstetrics, gynecology, therapeutics, ophthalmology and oto-laryngology. Fourth year—medicine, surgery, gynecology, obstetrics, psychiatry, neurology and public health.

Of the 90 students selected, 30 had two years, 50 had three years, and 10 had four years of college work. In considering college grades, the only ones considered were those in the so-called premedical sciences, chemistry, biology and physics. The average grade in each of these sciences was obtained by totaling the semester grades recorded in each subject during the two, three, or four years that the student was in college and dividing by the number of semesters the subject had been taken. The "college average" was obtained by adding the average in chemistry, the average in biology, and the average in physics and dividing by three.

In studying the high school grades, it was decided, first, to add the grades for the year in all sciences taken in high school. Those included were chemistry, biology, physics, physiology, botany and zoology. Most of the students had at least three of the above subjects in high school. These grades were averaged and the result was called the "science average." Next the "general average" was obtained by adding English and foreign language grades to the science grades and averaging the total. This was done because English and foreign language were the only subjects which every student had in high school. Many had no Latin; some had no history, etc., but all had four years of English and two or three years of some foreign language.

Therefore, I have listed the high school grades under two headings, science average and general average; the college grades under four headings, chemistry average, biology average, physics average and general average. The medical school grades have been listed under three headings in most cases, the average of the first two years, the average of the last two years, and the final or four year average. Chart I shows a sample work sheet from which the composite grades shown in Chart II were obtained.

No.	Class	Yrs. Coll.	High School Average Sci.	Gen.	College Average Chem.	Biol.	Phy.	Genr'l.	Avg. 1-2	Medical School +	-	Avg. 3-4	+	-	Final	Coll. +	-	H.S. +	-
51	1933	3	87.0	78.7	79.2	86.5	83.5	82.7	80.0		-2.7	85.1	2.4		82.6		-1.1	+ 3.9	
52	1933	3	78.6	79.3	74.5	79.1	77.0	76.8	80.5		3.7	86.1	9.3		83.3	+ 6.5		+ 4.0	
53	1927	3	70.5	70.9	62.0	65.2	71.0	66.0	79.6		13.6	83.4	17.4		81.5	+15.5		+10.6	
54	1925	3	81.0	78.5	75.4	69.0	66.5	70.3	81.0		10.7	84.8	14.5		82.9	+12.6		+ 4.4	
55	1926	3	89.0	87.1	78.2	70.0	69.5	72.5	77.7		5.2	83.2	10.7		80.5	+ 8.0		- 7.1	
56	1930	3	68.6	64.6	71.2	67.7	64.0	67.6	77.1		9.5	81.9	14.3		79.5	+11.9		+14.9	
57	1930	3	65.5	62.7	69.5	79.7	77.0	75.4	77.9		2.5	83.1	7.7		80.5	+ 5.1		+17.8	
58	1930	3	68.0	62.3	78.2	72.8	71.5	74.2	81.9		7.7	83.0	8.8		82.4	+ 8.2		+20.1	
59	1930	3	71.3	76.2	67.7	65.5	62.5	65.2	81.2		16.0	86.3	21.1		83.7	+18.5		+ 7.5	
60	1930	3	80.0	78.8	69.5	72.0	64.0	68.5	80.2		11.7	85.0	16.5		82.6	+14.1		+ 3.8	
61	1930	3	64.5	69.5	80.0	79.8	61.5	73.7	78.9		5.2	84.5	10.8		81.7	+ 8.0		+12.2	
62	1931	3	73.5	74.1	78.7	76.0	68.5	74.4	79.3		4.9	82.8	8.4		81.0	+ 6.6		+ 6.9	
63	1931	3	86.0	84.3	79.2	78.0	63.0	73.4	77.5		4.1	83.4	10.0		80.4	+ 7.0		+ 3.9	
64	1931	3	88.0	81.7	84.2	82.7	87.5	84.8	84.1		-.7	83.5	-1.3		83.8	- 1.0		+ 2.1	
65	1931	3	68.5	74.3	78.0	75.0	62.5	71.8	78.1		6.3	84.4	12.6		81.3	+ 9.5		+ 7.0	
66	1931	3	83.3	82.1	84.7	80.2	73.0	79.3	85.2		5.9	90.1	10.8		87.6	+ 8.3		+ 5.5	
67	1931	3	82.0	78.6	77.2	53.0	68.0	76.0	81.0		5.0	83.6	7.6		82.3	+ 6.3		+ 3.7	
68	1931	3	70.0	72.6	85.7	82.7	73.0	80.4	77.7		-2.7	82.6	2.2		80.3	- .1		+ 7.7	
69	1931	3	78.0	78.1	81.5	81.5	69.0	77.3	78.5		1.2	82.5	5.2		80.5	+ 3.2		+ 7.4	
70	1931	3	80.0	79.6	72.5	85.6	71.5	76.5	79.1		2.6	86.0	8.5		82.1	+ 5.6		+ 2.5	
71	1932	3	76.5	72.1	68.0	78.0	76.0	74.0	80.8		6.8	84.9	10.9		82.8	+ 8.8		+10.7	
72	1932	3	84.0	80.5	70.7	89.0	79.0	79.5	79.1		-.4	81.5	2.0		80.4	+ .9		- .1	
73	1932	3	69.0	69.4	82.1	75.8	69.5	75.8	79.0		3.2	80.5	4.7		79.8	+ 4.0		+10.4	
74	1932	3	76.3	77.4	74.0	77.5	71.5	74.3	79.8		5.5	86.1	10.8		82.5	+ 8.2		+ 5.1	
75	1933	3	81.3	77.6	69.5	86.0	77.0	77.5	78.8		1.3	81.8	4.3		80.3	+ 2.8		+ 2.7	
76	1933	3	92.0	84.5	79.5	79.6	86.5	81.8	81.9		.1	84.2	-2.4		83.1	+ 1.3		- 1.4	

CHART 1. WORK SHEET FROM WHICH GRADES WERE OBTAINED.

After completing this comparison of high school, college, and medical school grades in ninety students who were able to negotiate the course in medicine, it seemed that more might be learned by making a similar study in the case of a group of students who failed in their first year of medicine. I was able to obtain the necessary data on twenty-five students, all pre-

Years in College	Number of Students	High School		Union College				Albany Medical College			Gain in Medical School Average over	
		Science Avg.	Gen. Avg.	Chem. Avg.	Biol. Avg.	Phys. Avg.	Gen. Avg.	1st & 2nd Years Average	3rd & 4th Years Average	Four Yr. Average	High School Average	College Average
2	20	79.22	75.62	78.57	77.56	74.90	76.90	81.33	86.77	86.83	7.91	6.63
3	60	76.80	77.26	78.51	79.71	74.06	77.34	80.97	84.51	82.75	5.49	5.41
4	10	79.40	78.09	73.21	77.30	72.41	74.66	82.97	86.30	84.13	5.04	9.47
Average of Total	90	77.73	76.90	77.65	78.00	74.19	76.95	81.27	85.13	83.17	6.37	6.26

CHART 2. COMPARISON OF HIGH SCHOOL, COLLEGE AND MEDICAL SCHOOL GRADES OF 90 STUDENTS GRADUATED IN PAST TEN YEARS.

pared at Union College, and all having failed in their first year's work at the Albany Medical College. The results of this study will be presented in the same manner as those of the first study of the ninety successful students. (Chart 3).

The next thought was the comparison of the individual high school, college, and medical school records made by the ten students of the first group making the highest average grade for the four years in medicine, with similar records of the ten students of the second group making the

		High School		Union College				Albany Medical College
Years in College	Number of Students	Science Avg.	Gen. Avg.	Chem. Avg.	Biol. Avg.	Phys. Avg.	Gen. Avg.	First Year Average
2	5	69.52	72.62	73.80	71.18	69.60	71.72	68.36
3	13	72.06	71.50	70.29	68.75	65.56	68.20	67.20
4	7	75.77	74.63	67.49	75.07	72.07	71.54	67.94
Avg. of Total	25	72.59	72.64	70.21	71.00	68.19	69.84	67.64

CHART 3. COMPARISON OF HIGH SCHOOL, COLLEGE AND MEDICAL SCHOOL GRADES OF 25 STUDENTS WHO FAILED IN THEIR FIRST YEAR OF MEDICINE.

lowest average grade for the first year of medicine. These individual records are shown in Charts IV and V. Chart VI shows a summary of the entire study.

This study has been made in a spirit of curiosity perhaps more than anything else. It is not to suggest that any new criterion for the selection

of medical students has been discovered. I present the results for what they may be worth, and I leave the decision to you. Before drawing any conclusions, I will mention certain facts or figures not shown in the charts. These are the following:

1. Of the ninety successful medical students, seventy-two had higher averages in their first two years of medicine than in college. The greatest gain was 16, the lowest .1 point. Eighteen had lower averages in the first two years of medicine than in college. The greatest loss was 7.9, the smallest .4 point.

2. Of the same ninety students, seventy-seven had higher four year averages in medical school than in college, and only thirteen had lower. The greatest gain was 18.5 points, the greatest loss was 5.8 points.

	High School		College	Medical School	
	Science Average	General Average	Average	1st. Yr. Average	4 yrs. Avg.
E.N.P.	83.3	82.1	79.3	87.8	87.6
F.A.M.	78.0	79.2	83.8	83.2	87.5
H.E.R.	75.0	74.6	88.9	89.0	87.1
C.F.R.	94.6	89.9	92.8	91.4	89.4
C. S.,Jr.	92.3	88.8	89.6	88.2	88.6
K. M. A.	80.6	80.6	88.9	91.0	86.9
B.J.T.	89.3	88.3	75.5	86.2	88.4
G.A.G.	85.6	75.4	84.1	86.6	86.4
S.P.J.	80.0	76.4	80.4	87.4	87.6
M.A.D.	83.0	80.9	72.6	83.2	87.5
Average	84.17	81.62	83.59	87.40	87.70

CHART 4. COMPARISON OF HIGH SCHOOL, COLLEGE AND MEDICAL SCHOOL GRADES OF HIGHEST TEN IN MEDICAL SCHOOL.

3. Eighty-five students had higher averages for the last two years than the first two years of medicine; five had lower.

4. In the ninety records studied, the college average was nearer the medical school average in forty-eight cases. In forty-two cases the high school general average was nearer than the college average.

5. Among the twenty-five failures the highest college average was 79.4. The highest high school average in the same group was 81.2.

6. In the group of ninety students, the greatest discrepancy between high school and medical school averages in any individual case was a difference of 17.8 points, the medical school average being higher. In only

fourteen were the high school averages higher than those in medical school. The greatest difference in that direction was 10.6 points.

Name	High School		College	Medical School
	Science Average	General Average	Average	First Year Average
W.A.C.	70.0	73.8	72.0	62.8
G.J.N.	75.0	78.0	73.8	59.4
N.D.K.	73.5	71.0	64.8	68.2
J.J.H.	60.0	64.3	68.6	64.4
C.V.B.	73.0	73.0	67.6	66.2
G.R.M.	72.0	73.4	67.3	66.2
D.J.P.	72.3	75.6	65.9	64.8
J.A.McG.	68.7	73.3	72.1	68.4
W.A.S.	85.5	72.4	67.2	68.6
J.H.S.	60.0	70.7	60.5	35.0
Average	71.00	72.55	67.98	62.40

CHART 5. COMPARISON OF HIGH SCHOOL, COLLEGE AND MEDICAL SCHOOL GRADES OF LOWEST TEN IN MEDICAL SCHOOL (FAILED FIRST YEAR).

	High School		College	Medical School
	Science Average	General Average	General Average	First year Average
90 Graduates	77.73	76.80	76.92	81.39
25 Failures	72.59	72.64	69.84	67.64
10 Highest among Graduates	84.17	81.62	83.59	87.40
10 Lowest among Failures	71.00	72.55	67.98	62.40

CHART 6. SUMMARY OF ENTIRE STUDY.

SUMMARY

As to the final evaluation of the whole matter, I venture to say this: College grades in physics, chemistry and biology are certainly important

indicators of performance in medical school. Students with averages below 75 in these sciences are poor risks but may succeed. Discrepancies between college and medical school performance are frequent and cannot be accounted for. Virtually the same thing may be said of high school grades as indices of aptitude for medicine. While the average of a large group shows marked agreement in high school, college, and medical school accomplishment, there is no sure way of picking the few individuals who are bound to prove the exceptions. Nevertheless, if I were considering the financing of a student through college with the prospect of further aid in medical school, I would certainly want to see his high school grades. I might be misled by them, but I believe I would have a much better chance of making the right decision.

DISCUSSION

DR. G. CANBY ROBINSON (Cornell University): I would like to ask Dr. Randles what was the passing mark for all these students. Theoretically, at Cornell, we do not approve of numerical grades, but practically we have very great difficulty in getting the teaching staff to think in any other terms. We have a passing grade of 60 at Cornell University as a whole, and in the medical college, 75. I think 60 is better because it gives a larger spread. I think the passing grade is the whole matter that fixes the numerical standing of students.

DR. E. P. LYON (University of Minnesota): I was well aware of one fact brought out in this paper; namely, the better men seem to do better in medical school than they did in college, and the poorer ones do poorer in medical school than they did in college. I notice the figure for 90, with the fair group just reversed. The same is true of the highest ten and the lowest ten. The highest ten did better in medical school than in college, and the lowest ten did poorer in medical school than in college. These results are formed in the same institution with the same grading system. I wonder if Dr. Randles has any explanation of this fact.

DR. REGINALD FITZ (Harvard University): I should like to ask Dr. Randles one question. Did you by any chance link up the high school and college grades with the medical aptitute test?

DR. ROSS V. PATTERSON (Jefferson Medical College): This paper reminds me of a study which I undertook a number of years ago dealing with students of the University of North Carolina transferred to the Jefferson Medical College at the end of two years in medicine. The study was of the grades made in the arts college of the University of North Carolina, of the grades made in the two years of medicine at that institution, the grades made in the last two years of the medical course in the Jefferson Medical College, and the grades made by them in various state board examinations.

The study resulted in no important conclusion, since it early became evident that the records were curiously uniform. A man's record in college, in the first two years of medicine, and in the last two years of medicine, if he graduated, and his

grades in state board examinations all pointed in the same direction, that is, any one of these various tests resulted in about the same estimate of his abilities.

DR. E. S. RYERSON (University of Toronto): Dr. Bott of the University of Toronto made a rather interesting study some years ago which I have referred to in former meetings, in which men were graduated in medicine and their complete records taken, and the correlation worked out between that and their standing at their matriculation examinations. The interesting point was that the figure of correlation was so low that it was felt that the standing at matriculation was of no particular value whatsoever as to how the particular student was doing in his medical course.

DR. F. S. RANDLES (Albany Medical College): Answering Dr. Robinson's question as to the passing grade, I am very sorry I neglected to explain that. The passing grade at Union College is 60, and the passing grade at the medical school is 75. All these students with very low college averages, around 69, were considered doubtful at the time they were accepted, but they were accepted with the recommendation that they would probably do better in medical school than in their college work.

Dr. Lyon's remark about the poorer students becoming still poorer and the good students becoming better in medical school appears to be the case from the data I have shown. However, there is one thing that did strike me in the detailed study which I could not show, and that is the fifteen or sixteen students who did better in college than they did in medical school were all good students, not, perhaps, in the upper ten, but they were very close to it. They had averages in the neighborhood of 85, and apparently had been a little overestimated in college. We felt that way.

One other impression I got from this was that practically all of these successful students were crowded into the range between 85 and 87 in medical school. Most of the general averages came out in that range, whereas there was a wider range in the college averages. I think that is probably due to the greater flexibility of the grading system in college, where they have a chance to mark a man up and down more than we do in medical school.

Relation of Certain Factors in the Student's Premedical Record to Success in Medical School*

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The literature of general education has for years been filled with statistical reports on the relation of various factors to success in the arts and science colleges. These studies have investigated the relationship to college grades of the high school average, grades earned in the College Entrance Examining Board examinations, scores on intelligence and aptitude tests, age on enrollment, years of Latin or other subjects studied, and innumerable other factors which the industrious graduate student might believe would form the basis for a master's thesis.

The present study selected a number of the factors which had proved to be of some value in predicting success in the arts college, and one or two other factors which gave some promise of successful prediction in medicine. An investigation of the actual relationship of these factors to the grades earned in the first year of medical school was made. The factors selected for study were as follows: scholastic average in college in premedical courses; the Moss medical aptitude test scores; total amount of premedical training completed before enrollment in the medical school; age at the time of enrollment in medicine; grades earned in college in laboratory science courses; and total amount of chemistry and zoology completed in college before coming to the medical school. The report is, therefore, the result of an investigation of the relationship between grades earned in the first year in the College of Medicine of the University of Illinois and the following six factors: age of the student, premedical college average; medical aptitude test scores; number of years of premedical training; average in laboratory science in college; and number of semester hours of college credit in chemistry and zoology.

The study is subject to certain limitations which must be borne in mind in interpreting the findings. Included were the members of only one class, and their grades are for only the first year in the medical school. The University of Illinois takes each year 175 first year students. A few of these were repeaters and their records were not included. Of the 175 who started, there were 159 new students who completed the year and their records formed the basis of the study.

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However, I shall refer at times to a similar study made at the University of Chicago by Mr. W. F. Cramer.

The admission requirements included a minimum of 60 semester hours with an average of not less than B minus in all college work.

In considering such data for medical students, we must remember that in computing relationships, that is, in figuring correlation coefficients for any group which is not a random selection but which has been selected arbitrarily according to one or more artificial standards, we have necessarily lowered the amount of correlation possible. Ordinarily, the higher the standard of admission, the lower the correlation. To illustrate: a certain medical school, "X", admits students who pass in 60 semester hours of college work; a certain percentage fail and the others earn grades on a fairly normal curve. Usually, the failures were low in college grades and the correlation between college and medical grades was fairly high. Later, this college decides to admit only on a definite minimum average, such as "B." Some students will still fail, but instead of these failing students having low premedical averages, they must, perforce, come from the same general grade group as those who pass. They fail not so much because of lack of ability as because of lack of interest, outside interference or some other similar factor. Previously, such students had passed, presumably because of the weaker competition from their fellows. This brings us back to the original contention that by raising our admission requirements on a scholastic basis alone, we reduce the relationship between the premedical record and grades in the college of medicine, that is, the correlation coefficient will be correspondingly smaller.

As stated above, the members of the class studied, with few exceptions, had college averages of B minus or better. They were, therefore, an artificially selected group. The actual correlation between their college grades and the grades in the first year in medicine proved to be .49[1]. This figure, .49, is low for practical purposes; and although it does indicate a definite relationship, it is not very helpful in predicting the medical record of any specific applicant. Such a correlation justifies only a general assertion that the student who does well or poorly in his premedical work will probably do well or poorly in medicine. The student with a 90 average in college will probably average somewhere near that in medicine, but the exceptions will be numerous.

1. University of Chicago (Cramer), .53; Moss, .51.

In general, reports published for many years have agreed that the four year average in high school was the most reliable single index of what a student would do in college. The student who did well in high school was practically certain to succeed in college. One reason for that is that many college courses, particularly those given in the first year, are direct

continuations of courses taken in high school. In medicine there is a somewhat different situation with a rather large break in the type of subject matter studied. The college student may almost be said to be entering a new world when he enters the medical school. The materials studied, the terminology, the methods and the surroundings are all different. The fact that even with an artificially selected group a correlation as high as .49 exists between premedical grades and medical grades may presumably be interpreted to mean that fundamentally a student with the ability to do well in college will ordinarily have the ability to succeed in medicine. The reverse will also prove true, one who does poorly in college will usually do poorly in medicine.

A large number of college aptitude tests are being used, and many reports available are on their reliability in predicting success or failure in college. The college freshman who escapes even one aptitude test is, indeed, unique. Unfortunately, no infallible selective device has ever been invented, and we still find students failing in college. However, some rather hopeful reports have appeared.

The Moss medical aptitude test has had a wide range of use, but the reports of its reliability have been somewhat confusing, due probably to different types and standards of teaching and of giving grades. The correlation between scores in the medical aptitude test and medical grades in this study proved to be only .42, somewhat lower and, hence, less reliable in prediction than the figure for college grades. A further analysis of the individual records of the 11 members of the class with percentile scores below 10, that is, who scores in the lowest 10 per cent of all who took the test, showed that only 3 of the 11 completed the first year with no failures, but that all 3 of these made relatively strong records. On the other hand, 6 of the 11 were dropped for unsatisfactory work. If all of the 11 had been refused admission, 3 good students, 2 mediocre but passable students and 6 very poor ones would have been eliminated. Apparently, a very low score on the medical aptitude test is quite likely to be followed by a poor medical record. But, again, the exceptions are numerous. The opposite did not prove to be the case for those with high ratings on the test. They did not prove to be the best students.

We now turn to a consideration of the relation of age to medical records. Reports of studies made in high school and in the arts college agree that the younger students usually are the more able, not because they are younger but because they have had the ability to go ahead more rapidly than their fellows. However, students who are younger are frequently considered to be under a handicap in medicine and the statement is often made that one should wait until he is somewhat mature in age before registering.

The members of this class were divided into age groups as follows: under 20; 20 to 23; 23 to 26; 26 to 29, and over 29. There were 18 students in the youngest age group, most of them being about 19 years old. The average for the entire class, with 70 passing, was 77.5. The youngest group, that is, those under 20, averaged 82 and not one of them failed in course. Of the entire class of 159 students, only 4 averaged above 90, and 2 of these 4 were under 20 years of age. The other age groups were all about on a par, although the oldest group made the poorest average.

Here is fair evidence that there is no need to worry about the younger students in medicine. Clearly, this youthful group, as a whole, excelled any of the older groups in this particular class. Youth may be a handicap in understanding some things in medicine but certainly it does not show in earning grades. The student who has the ability to complete his premedical requirements early appears to have the ability to continue successfully in medicine. The study at the University of Chicago found very little in favor of any one age group—all groups being about equal.

Another question frequently raised and often discussed concerns the relative success of medical students who had two, three and four years of premedical college training. Some studies have been reported but the evidence found in favor of the more lengthy requirements has not been conclusive. The members of this class were divided into three groups, having, respectively, less than 75 hours of college credit, from 75 to 104 hours, and 105 hours or more, these three groups having roughly two, three and four years of work. Their premedical averages were computed along with the average for the first year. The relative standing of each group proved to be approximately the same in college and in medicine, and there was no statistically significant evidence in favor of any one group. Those with the largest amount of credit averaged the lowest in medicine, but as they had also averaged somewhat lower in college, one can hardly assert that the additional college training was a handicap. The definite conclusion appears to be justified, however, that for this particular class the students with three and with four or more years of college training earned no better grades in the medical school than those with but two years of college work. The additional college training and experience did not pay off in dividends as far as grades are concerned. It is rather evident that one cannot reduce the requirement to less than two years since so much of the two-year course is prerequisite to the actual fundamental medical work. On the other hand, the statistical evidence does not indicate any need to increase the two year requirement. Here, again, the University of Chicago study differs slightly. There the four year students proved to be slightly better than those with two or three years of college work. This seems also to be the case in the

figures given in the pamphlet distributed yesterday on the study made by Dr. Zapffe.

The work of the first year in medicine is practically all laboratory science. The premedical requirements were approximately one half laboratory science. A legitimate question arises, should there not be more relation between the science record in college, that is, the premedical science grades, and the medical record than is true of the entire premedical record? Instead of computing the general college average, why not omit the record in English, foreign language and the social sciences and scan only the various laboratory courses? This question was also investigated. For this group, the correlation coefficient between the grades in laboratory science and first year medicine was .57 as compared with the figure of .49 for all college grades and figures of around .40 for each separate subject. The relationship between the premedical laboratory science grades and the first year medical grades was, therefore, considerably greater than that between the complete college record and the medical grades. In other words, to predict an applicant's probable record, it is better to see what he has previously done in science alone rather than study his entire record. This difference in correlation coefficient is large enough to be significant and may well lead to changes in our own policy toward applicants. At least, it will form the basis for further study. The University of Chicago found much the same figures.

An investigation was also made of the relative success of students who carried more chemistry and zoology than was necessary for admission. At the University of Illinois applicants must present at least 8 semester hours of general chemistry and 4 of organic chemistry. The zoology requirement is 8 hours, 4 of which must be vertebrate zoology. In chemistry, there proved to be very little difference. The group who carried the extra work did no better in their first year (during which the course in physiological chemistry is taken) than those with only the minimum requirements.

The situation in zoology proved to be just the opposite. Almost three fourths of the class had one or more extra laboratory courses in this field in college. The two groups had about the same premedical average, yet the group with the extra unrequired courses excelled the other group by a considerable margin in their total first year's average in medicine. The explanation may lie in more laboratory training in a field closely related to the work of the first year, or it may be that the taking of the unrequired courses indicated greater interest in the study of medicine. Whatever the explanation, these findings are interesting and also merit further study. Most of the students who took extra zoology had a course in vertebrate embryology and such a course may be of real value in the anatomy work.

This study, based as it is on only 159 students, nevertheless points to some very interesting conclusions. At least, it indicates the advisability of additional study.

SUMMARY

These conclusions may be summarized as follows:

1. No single factor bears a close enough relation to the grades of medical students to predict at all accurately the actual grades which will be earned by an individual applicant. The grades earned in laboratory science courses in college were the most reliable, and the student who does well, or poorly, in college in these fields, will usually do well or poorly in his medical work.

2. Although the correlation between scores on the medical aptitude test and the medical grades was relatively low, the majority of those individuals who made very low scores on the test made decidedly low grades in medical school.

3. The youngest students were, as a group, the best students in their first year of medical work.

4. The students who had completed three or four years of premedical training were no more successful than those who had only two years in college.

5. Students who carried extra, unrequired laboratory courses in zoology earned better average grades than those who entered with only the minimum requirements.

The study is being followed up, and each year's record is added. Furthermore, each new first year class will be included in the hope, thus, to have some definite conclusions within a few years. I doubt if any school can, or really hopes to eliminate all failures—but they can understand better the factors likely to accompany failure.

DISCUSSION

Dr. F. A. Moss (Washington, D. C.): Dr. Moon's very excellent paper brought out three points that are somewhat at variance with the general opinion of admission officers. These points should be given further consideration.

First, the young do better relatively in the medical school work. Second, the three or four-year premedical students do no better than those with two-year training. And third, those with more training in the sciences, especially in zoology, do better than those with a preponderance of training in the general cultural subjects.

The findings of our Committee agree fairly well with what Dr. Moon brings out. The reason, of course, the young do better is the fact that they are better students to begin with, and consequently get into medical school earlier. You have in their case a highly selected group. Probably, the same thing is true in connec-

tion with the men who get into medical school after two years in contrast with the men with three and four-year training. They are better students.

This training in sciences, especially in biological sciences as opposed to the cultural subjects, has been talked about once or twice, with the idea of giving more and more cultural subjects as contrasted with the more specific biological subjects.

I think the students who have the training right along the lines they are going to follow in medicine, especially in comparative anatomy, embryology, and that sort of thing, will do better in medical school. The opposing consideration is whether we want a broad cultural background or more specific training.

In the case of the young students and those who have had only two years of training, while they are naturally brighter, it might be worth considering that if they had their A. B. degree they would probably do still better in their medical school work.

DR. E. P. LYON (University of Minnesota): I have two questions to ask Dr. Moon, or anybody else who can answer them. If I remember correctly, Dr. Moss said yesterday that of all the premedical sciences physics gave the best prognostic value.

DR. MOSS: Physics given for the freshman year all over the United States; chemistry for the four years. There was not a great deal of difference.

DR. LYON: At any rate, the question is whether it would be found that physics had this superior predictive value.

The second question relates to mathematics. The dean of our law school says —I believe, on the basis of real investigation—that mathematics is the best subject to prophesy success in law. As a result of cursory examination of many credentials, I am inclined to think the same thing is true of medicine. What I want to know is whether Dr. Moon, or anybody else, has followed this question out as to the relation of mathematics to success in the medical course.

DR. MOSS: I do not have that information. It would seem that those who do well in physics would do well in mathematics.

PROFESSOR W. C. MACTAVISH (Washington Square College, New York University): In our college, we do not permit the premedical students to take physics until the sophomore year because we would rather have them take their mathematics first. I find that if they do well in mathematics, they usually do well in all their premedical work and are successful in medical school.

MR. GEORGE R. MOON (University of Illinois): The question Dr. Lyon brings out is a rather interesting one. The fact is that mathematics very definitely calls for a certain type of mental ability, and I imagine that the student who is able to reason well in mathematics is rather likely to do well in any subject. Mathematics calls for real intelilgence and thought on the student's part.

Of course, the correlation between grades in medicine and those earned in physics probably answers the question as closely as it can be answered. Students who take a variety of mathematics courses do so because they are interested, and because they do well in the subject. Those who take as little as possible are likely to be the ones who are having trouble with it.

It is a question that should be followed up, because the student who is going into medicine generally takes his mathematics first, and if we can pick out the one who has the least chance to make good in his first year of premedical work, that is the logical place for us to turn him in some other direction.

The Medical Curriculum

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"I am convinced," states President James R. Angell[1], of Yale University, "that the present curricula of many of our medical schools are staggering under a useless legacy of traditional subject-matter, which could be curtailed to a great extent. Reorganization of medical courses would be a great improvement, and would result in the saving of the time and energy of the student and would materially increase his actual mastery of the practical problems with which he is later to be confronted. It might be necessary to establish a few new chairs, but the results would be worth the cost and trouble."

It has been said: "A school is like a thrashing machine; it can make just as much noise when nothing is coming out as when wheat comes through."

Subsequent to the above introduction, I desire to offer some discussion of the medical curriculum. May I interject, however, at this point that the most comforting feature regarding the medical curriculum is that its sharpest critics are members of the medical profession. The medical faculties are constantly displaying a healthy manifestation in trying to improve the education for which they are responsible.

OBJECTIVES OF MEDICAL EDUCATION

It is a principle of educational philosophy that education will be conducted most effectively if, first, its objectives are determined, and then procedures be adopted to achieve these objectives.

Is not medical education a vocational training, i.e. a training for the practice of medicine? A dictionary[2] definition of a vocational school is one whose main purpose is to provide training for the occupations or vocations whether in the professions, commerce or trades. A profession is a calling in which one professes to have acquired some special knowledge used by way either of instructing, guiding or advising others or serving them in some art. The designation "vocational" is not, therefore, opposed to "professional" as applied to medical education. If the reader, however, feels[3] that "vocational" implies the "direct utility in a future career" or "how to use the tools of a restricted field," he may prefer to use the

1. Address at the installation of Dr. Frank L. Babbott, Jr. as president of the Long Island College of Medicine, Brooklyn, N. Y.
2. Webster's International Dictionary.
3. LOWELL, A. L.: President's Report, Harvard University, 1931-32, p. 1.

term "professional." The choice of the designation is of minor importance, provided the education be broad enough and effective for the practice of medicine.

Let me emphasize that for the purposes of this discussion the curriculum that is applicable to the undergraduate in the medical schools is in mind. There appears to be a general agreement that it is the function of the medical school to educate the undergraduates for the general practice of medicine. The education for the various specialties of medicine is a function of postgraduate education and its curriculum is not under discussion in this paper.

It is, doubtless, natural for physicians to think of the objectives of medical education in terms of the subjects studied in medical schools. However, it is the purposes, or objectives, for which courses are given in these medical subjects to which I would direct the reader's attention. It is hoped that thereby some fresh ideas may be gained regarding the medical curriculum. I will suggest, therefore, an analysis of the objectives of medical education, couched in language not directly derived from the subjects listed in the catalogs issued by the medical schools. The reader, to whose prior thinking this form of statement of the objectives of medical education may be foreign, is urged to read attentively the analysis, and to turn back to it, as occasion arises, in reading the discussion which follows.

OBJECTIVES OF UNDERGRADUATE MEDICAL EDUCATION

1. General Objectives
   (*a*) Primary: Vocational efficiency (for general practice).
   (*b*) Secondary: The advancement of medical knowledge. Service: To the individual. To mankind.
2. Specific Objectives
   (*a*) Knowledge: How to diagnose and treat ordinary cases; obscure cases.
   Special Skills: Methods of examination; use of certain instruments.
   What to do in emergencies.
   When to call a consultant.
   The development of sound clinical judgment.
   The prevention of disease.
   Health examinations.
   Treatment of the patient's soul.
   Medical ethics.
   (*b*) Reading.
   To assist in diagnosis and treatment.
   To continue medical education by: Keeping abreast with the

growth in medical science. Stimulate increased interest in the subject.

(*c*) Writing and speaking.
To contribute to medical literature.
To participate in medical meetings.

(*d*) Mental habits.
Thoroughness, accuracy, orderliness, open-mindedness, resourcefulness, intellectual curiosity and the research spirit, scientific spirit—discrimination between facts and theories, and cooperation with fellow physicians and with medical and public health organizations, and the like.

(*e*) The art of medicine.
How to be understood by patients of different intellectual levels.
How to inspire faith.
How to get along with the patient.
How to keep up the patient's courage.

(*f*) The business side of medicine.
The keeping of adequate records.
The essentials of a good office.
The collection of accounts.
Malpractice insurance.
Testifying in court.

The foregoing list, though formidable, is doubtless not complete. The analysis is offered as tentative. It might be improved after obtaining an adequate survey of the work and problems of the general practitioners of medicine. There is some question as to whether, in the education of students for the pursuit of general practice, the advancement of medical knowledge should be deemed to be a primary or a secondary objective. The reader may be better able to judge the value of disabusing our minds of the subjects studied in medical school and stating the objectives in such terms, as above, after perusing the remainder of this article.

ACHIEVEMENT OF THE OBJECTIVES

How are these objectives to be achieved? Does each objective indicate the introduction of a special subject into the curriculum? Certainly not! John Dewey, the philosopher on education, has said that if the main objectives of education are correct, the concomitant values will take care of themselves. Another viewpoint is that if the concomitant values, or secondary objectives, are worth while, they should be given definite recognition and attention.

We should remember that two of the greatest sources of misleading arguments about the value of studies[4] are the false assumptions that by merely putting a subject in the course of study we can put its value into the lives of the students, and that the value which a subject may have when pursued with zeal by an expert will be realized when it is studied by young students. Expert lovers of a study are likely to feel sure that, since it does so much for them, it should be studied by all. They learn their error if they observe the actual results of teaching the subject to typical students.

Many of the objectives listed above are not of the sort that should be taught by a special course. For example, the mental habits, are furthered by creating a favorable atmosphere to which the students are subjected. In other words, if the medical teachers are sufficiently aware of the desirability of such mental habits in their students they may use them as objective checks on their work as teachers. In fact, then, the atmosphere that will be conducive to these desired mental habits should permeate every course in the medical school.

The objectives listed under the topic "The Art of Medicine" may be mentioned as another example of objectives that do not indicate the introduction of a specific course in the medical curriculum. The education in them is acquired more by the example of the clinical teachers employing them as they deal with patients in the presence of students. They should be taught, of course, by the appreciation technic[5]; the art of medicine has little place in the written examinations. Occasionally, it may be well to correct a student or give a word of praise, as the case may be, and at times a few words may be helpful in order to make the relatively nonobservant student more aware of the importance of the art of medicine.

Further discussion of the achievement of the objectives will be waived at this point. It is assumed that the reader will understand, in the terms as listed in the analysis given, that they are to be considered as objective checks; few, if any, suggest the subject of a special course.

SUBJECTS AND THEIR CONTENTS

What subjects are to be studied and how much of each? There will doubtless be a healthy difference of opinion regarding the answer to this important question, but it is suggested that it can be answered satisfactorily only if the subjects and their content can be justified as pertaining to the primary general objective of medical education, namely that of vocational efficiency. It is repeated, also, that the work of the medical school concerns the preparation of its students for general practice. This article

4. Thorndike, E. L., and Gates, A. L.: Elementary Principles of Education; The Macmillan Co., New York, 1929, p. 165.

5. Reid, W. D.: Teaching Methods in Medicine. The Application of the Philosophy of Contemporary Education to Medical Schools. Privately printed, 1933.

is not concerned with the education of men for the specialties which should be a matter of postgraduate education.

It may be timely to remind the reader of the difference between education that is traditional and that which is functional. Knowledge that is introduced into education is usually functional at first; soon it becomes organized and later it becomes fixed. Such knowledge often becomes traditional; it is continued largely because of habit. Its removal meets resistance. We should all be more conscious of the danger of retaining knowledge that has become traditional and is no longer functional; i.e., knowledge that is not really usable, and justifiable for vocational efficiency.

Who should decide on the content of the medical curriculum? Should it be those actually engaged in the practice of medicine? The answer may at first seem to be in the affirmative. However, an individual may be a successful practitioner and yet not have a clear insight regarding the education that is most valuable. Success in practice and knowledge of education are not necessarily associated; it is granted that the reverse may also be true. It is possible to be interested in and to learn much of a subject and yet be relatively oblivious to how the subject should be dealt with in medical education.

Should the student decide on the curriculum? Obviously, "No," since he is not sufficiently familiar with the subject to make sound decisions. He can, however, be given some opportunity to criticise the method and quality of the teaching, namely, that it is dull rather than stimulating; that it obscures rather than clarifies; that is imposes an impossible load or even a load that is too small for the time allotted, and the like.

Should the faculty be granted the determination of the content of the curriculum? It does so now and, doubtless, should continue to do so. Experience, that can be acquired solely by teaching, gives information that is significant regarding the curriculum. But, of course, something more is needed than experience in teaching if the faculty is to be fully successful in the determination of what to teach.

We medical teachers are a cloistered group. Are we not? This seems true, at least, of those concerned with the preclinical branches of medical science, and with many of the teachers of the clinical specialties. In recognition of this tendency to be cloistered people, teachers in some of the lower schools are spending part of the summer vacation as employees in some industry, a glove factory, for instance, so as to know at first hand what the world at large does, how it lives, and what it thinks. They hope to get from this experience ideas as to the sort of education which will be most valuable for their students. Can medical teachers do an analogous

thing? A few may, perhaps, be able to substitute for some general practitioner during his absence on vacation, but it seems unlikely that the procedure will become widespread. It is not difficult to think of obstacles to the temporary entrance into general practice. How, then, are medical educators to know clearly for what the students are being trained and, so, what education is functional?

The survey is a method that may be helpful. It may be used to obtain information as to just what it is that physicians engaged in general practice (the field for which the medical school is training its students) are called on to do; what problems they have and how they meet them; what part of their education is excessive and what is inadequate.

What general practitioners should be included in this survey? Should it be limited to the most successful, and, if so, how is the rating of "successful" to be determined? There may be some difference of opinion on this point. The practitioners selected should have had at least several years experience in practice. Members of the faculty of a medical school may select former students whom they deem to be suitable. Clinical teachers, in particular, are likely to know practitioners of the type that should be suitable. However the practitioners are selected, whose work is to be included in the survey, the survey should not be too limited in scope.

Will the survey, suggested above, give sufficient data on which to build the curriculum? What about the specialties in medicine? It may well be that the general practitioner lacks an adequate realization of that part of the various specialties in medicine that he should know. The specialists themselves may know better from their experience in consultations with the general practitioners and in the cases referred to their offices the part of their various special fields that the general practitioner can and should know. Suitable data may be obtained from the specialists who are members of the faculty of the medical school and those without such affiliation.

Right here it is emphasized that in utilizing the data obtained from the specialists, attention be given that the load imposed on the student be suitable for the time available for its study, and, furthermore, we must all resist, should we not, the well known tendency of experts to round out their subject as a whole and thus to cause every student to study material that is useful only to specialists in the subject.

What about the laboratory subjects? There may be a fear that the general practitioners may not be able to give a satisfactory estimate of just how much the laboratory or preclinical subjects should enter into medical education. However, it would be wise to ascertain their opinions. General practitioners should be able to indicate the problems they have to meet and their need for the assistance that subjects such as biochemistry,

physiology, etc., bring or fail to bring to them. It is my opinion, that the results of an adequate survey should serve to dispel the doubt as to the value of the information pertaining to the laboratory subjects.

The method of conducting the survey warrants some comment. Should it be by a written questionnaire? I will summarize some of the statements of one[6] who has studied the technic and results of surveys.

In all cases the personal interview was found to be preferable to the written form. The returns on the oral questionnaire were 350 per cent fuller than were those on the written one, although the identical questions were asked. The limitations of the written questionnaire were analyzed as follows: (1) difficult to fill out; (2) questions misunderstood; (3) answers may be misunderstood; (4) sampling poor, and (5) answers inexact.

The personal interview was, then, found to be superior. The interviewer should continually ask "How"?; methods are more important than generalities. From seven to ten topics were enough for the interviews, and thirty individuals the most satisfactory number to interview on any one topic, since no more suggestions were obtained from sixty individuals than there were obtained from thirty, above which number repetitions began to appear. The subject matter was, as might be expected, uneven in quality.

Who should act as interviewers? The medical faculty for whom the survey is being made should select as interviewers such men as they deem to be satisfactory. The interviewers should, of course, be physicians, and they may or may not be members of the faculty. Some experience in practice and the possession of tact would seem to be desirable. The nature of the questions to be asked should receive careful consideration. The results and experience gained from the initial survey should give guidance regarding any changes to be made in the conduct of those undertaken subsequently. There are, of course, numerous difficulties that may be met in the initiation of the practice of a survey for purposes of obtaining information regarding the needs of the medical curriculum; these difficulties should not, however, be allowed to prevent the undertaking of such a survey.

There are, it is true, a number of valuable lists[7] of the diagnoses pertaining to the patients appearing in general practice. However, the survey I am suggesting should seek considerable information apart from that contained in a classification of the patients who seek treatment. For instance, we should like to have for consideration the opinion of the general prac-

6. Charters, W. W.: Curriculum Construction; The Macmillan Co., 1923.

7. Bass, C. C.: Demands on Medical Practitioner in the South During Period of One Year; *Bull. Assoc. Amer. Med. Colls.*, 3:305 (Oct.), 1928; Lane, C. G.: The General Practitioner and His Work; *New England J. M.*, 201:353 (Aug.) 22, 1929; Final Report of the Commission on Medical Education, 1932, in Appendix.

titioners regarding what they believe the medical school did for them and what it failed to do; namely its success and its shortcomings.

If a survey, patterned somewhat as suggested above, be made, it seems probable that the results would warrant publication and, depending on the degree of approval given to the published survey of the work of general practitioners, many schools of medicine might feel it unnecessary to make one of their own. Sufficient details regarding the methods used in the survey, such as who were the interviewers, and other data should be included in the published report of the survey. It would be desirable that a number of surveys be made to give greater variety in the work of the practitioners interviewed. Due attention should be paid to whether the practice was urban or rural, industrial or non-industrial, among the wealthy or poor, and other considerations that would affect the results. In other words, the sampling should be broad enough to ensure a result that would be worthy of serious consideration.

Should the education of physicians be national in its scope? In other words, how much attention should be paid to its geographical location? For example, practitioners in the northern part of this country have little occasion to treat tropical diseases if they remain in the northern section of the country. They will, doubtless, forget much of what they learned about the cycles of the estivo-autumnal type of malarial fever. It would seem best to entrust the matter of the degree of consideration to be given to the geographic location of the school to its respective faculty. Some schools train physicians who remain mostly in the same section. Most schools prefer to offer an education that is sufficiently national in its scope to enable those of its graduates who go to a distant section of the country to add with ease the additional knowledge that may be needed for that particular region.

Some information regarding the work of physicians can, of course, be obtained from noting the contents of medical journals. However, such sampling is apparently inadequate since the general practitioner is not a frequent contributor to medical literature; and when he does contribute it may be solely in relation to some unusual disease entity.

CONTENT OF INDIVIDUAL SUBJECTS

Medical science is constantly undergoing a change due to growth in knowledge, and new and unforseen social conditions. The same is true, though to a varying degree, in each of the individual subjects studied in medical school. The individual differences between students prevents them from acquiring just the same information about the same subject. In fact, no two physicians have exactly the same experience in or knowledge of medicine. This is one of the reasons why we learn by exchanging ideas

in conversation, in medical journals, and in medical meetings. Uniformity in knowledge, whether desirable or not, is unattainable in non-medical fields, and the same is true in medical science.

Physicians do, however, agree pretty much on the major facts—the so-called fundamentals; the differences of opinion are usually in the relatively minor points. The significance of the foregoing statement should be given consideration in the content of each subject. The fundamental facts of the subject should be given greater attention. Their importance should be made clear to the students and then taught for mastery.

The minor points, in which there is some difference of opinion, should be presented in their true position, i.e., as minor points about which full agreement does not exist. This effort to avoid dogmatism will lessen the confusion that may be caused to the student and enable him to retain confidence in what he has learned.

The remaining material pertaining to an individual subject may be studied as far as is reasonable for the time allotted; in other words, the load should be suitable. The teacher need not be too concerned lest the students fail to get it all; his students are not then preparing to be specialists. Decision as to the content of the course in any individual subject may well be much influenced by its bearing on the primary objective of medical education, namely, vocational efficiency as indicated in the data obtained from the survey already suggested.

It may be well, also, to mention that errors[8] prescribe emphasis, not content. The content is determined by the usefulness, while the emphasis is distributed according to the difficulties.

It is a principle of teaching that the teacher should be free. We wish the teacher to be thinking constantly about his work, and if he is forced too much along prescribed pathways, there is a tendency to check his thinking. This freedom, however, does not imply license. Since there is no formal teacher training for members of the medical faculty—as is equally true of practically all schools subsequent to the high school—it would be well if at least the heads of departments acquire some familiarity with the philosophy of education and then exert a helpful guidance over the newer and younger teachers so that the latter may conduct their work more effectively. In due time greater freedom may be granted to the new teachers as they give evidence of a sound understanding of the part they play in the education of the students.

The adverse criticism of the content of the courses in the preclinical subjects continues. Many practitioners and a considerable portion of the clinical teachers feel that the preclinical sciences, as usually taught, do not

8. Charters, W. W.: Curriculum Construction. The Macmillan Co., 1923, p. 82.

reach the desired effectiveness in the education of the average medical student. I would raise the question as to whether the preclinical subjects are not more effectively taught if they are taught less as pure sciences and more with regard to the objective check of their contributions to the training of general practitioners of medicine. One writer[9] expresses himself thus: "Our preclinical brethren tell us the trouble is we do not sufficiently emphasize, in the clinic, the bearing of what the students have previously been taught on the clinical problem before them. At this we scratch our heads for a ready reply, but the obvious answer is that what the students have been taught has no apparent bearing on at least 75 per cent of the countless minor ailments with which they must become familiar—the flat-footed head waiter; the old man with a chronic scab on his lip; the young woman with a backache or a lump in her breast; the baby with convulsions; the workman with an infected or injured hand which, improperly treated, may be the end of his wage earning days. . . . With such things the vanishing race of family physicians was once chiefly concerned, while the chiropractor and science healer now take his place."

It is not deemed necessary that I defend the present content of the preclinical studies. The teachers of these courses speak for themselves in medical literature. It is assumed that the analysis of the objectives of undergraduate medical education and the information obtained by the suggested survey will find suitable applications in the preclinical courses.

ALLOTMENT OF HOURS TO SUBJECTS

The amount of time allotted to the various subjects may well be left to the faculty of the medical school. The experience in teaching should enable these men to determine the number of hours needed for the various subjects. The relative importance of the subject and the difficulty it presents to the student are the two most important determinants of the number of hours that should be allotted to its study. The frequency of its occurrence in the suggested survey of the work of general practitioners, and in mortality statistics, and the space given to it in a number of representative textbooks are of secondary value as criteria for the hours to be allotted to the study of a particular subject.

One can consult previous studies[10] of the allottment of time to the various subjects. These show a wide variation between the schools. This is deemed to be healthy by those who disapprove of excessive standardization in medical education.

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9. Cushing, H.: Consecratio Medici and Other Papers; Little, Brown & Co., Boston, 1929, p. 193.

10. Reid, W. D.: The Curriculum, J. Ass'n. Amer. Med. Colls., 6:283 (Sept.), 1931; Report on Curriculum—Report of the Committee on Education and Pedagogics of Ass'n Amer. Med. Colls. Proceeding of the Thirty Third Annual Meeting, March, 1923, p. 157; Zapffe, F. C.: A Proposed New Curriculum, Bull. Ass'n Amer. Med. Colls., 2:322 (Oct.), 1927.

Should there not be some flexibility in the allottment of hours as determined by individual teachers and variation in the students? One teacher may require more time than another to conduct his course adequately. An occasional class of students may be superior and be able to complete the desired work in a shorter period. Why check them? There should be small difficulty in using the extra time effectively or in making it free time that is so much needed in the curriculum of the average medical school. There comes to mind the practice in vogue many years ago when an entire school was built around one or two brilliant teachers. In case a modern medical school possesses such a teacher and is able to recognize it, would it be a mistake if the students were allowed more time to work under his guidance?

Harvey Cushing[11] writes regarding the "struggle for elbow room between established courses, of which there are too many. Never, as far as I recall, has such a topic arisen as the comparative abilities of the teachers to give inspiration, whatever their subject—" And "The personal equation of the teacher does not appear in the syllabus issued from the dean's office, though it is known in every student's boarding house."

POSITION OF THE SUBJECTS IN THE CURRICULUM

There is an increasing conviction that there has been too complete a separation of the preclinical from the clinical subjects. Some of the clinical work should be introduced in the first two years and some of the preclinical sciences should be deferred for the third and fourth years[12]. The attempts at correlation of these two sections of medical education represent steps in this direction. The introduction of some of the clinical work in the earlier part of the period spent in medical school very greatly improves the motivation for the preclinical laboratory studies; the purpose of the latter becomes much more apparent to the student. The postponement of suitable portions of the laboratory studies until the clinical years makes their study much more timely. They are studied more closely to the time when they are likely to be used. This conforms to the educational principle that knowledge that is not promptly put to use is soon forgotten. The reader need only recall the distressingly small carryover of the knowledge of the preclinical sciences into the clinical years, in schools in which the subjects are kept in separate years and in well-nigh watertight compartments.

It is my opinion that this untimeliness of much of the laboratory subjects is a major factor for whatever degree of failure there may be in their

11. Cushing, H.: Loc. cit. pp. 190 and 192.
12. Report of the Committee on Educational Policies, *J. Ass'n. Amer. Med. Colls.*, 8:358 (Nov.), 1933.

desired contribution to medical education. Perhaps, if the preclinical teachers were more convinced of the limitation on the effectiveness of the untimely study of a subject, they would be unwilling to conduct their courses so largely prior to the clinical subjects. Is it not possible that we have been unwise in our desire that the student should know all the fundamentals, of the clinical as well as the preclinical subjects, before seeing the patient? Would it be of some assistance to discard the name "preclinical" for, perhaps, "laboratory" subjects?

The data[13] pertaining to the average number of hours allotted to the various subjects in medical school have been subjected to further analysis.[14] It was found that slightly more than one-half the time was allotted to the subjects that are mainly preclinical (anatomy, physiology, chemistry, pathology, bacteriology, pharmacology, public health, preventive medicine and hygiene). The remaining half is divided into (1) general medicine, general surgery, pediatrics and obstetrics, and (2) the specialties (eye, ear, nose, throat, diseases of the nervous system, gynecology, dermatology, syphilis, and orthopedic surgery) in a proportion of 82 per cent and 18 per cent, respectively. Dr. Simpson asks if this warrants the criticism that "the whole spirit of medical education has been such as to encourage narrow specialization for the exceptional student."

GENERAL COMMENT

It seems self-evident that the curriculum pertaining to medical education should constantly be changing. How otherwise can it keep up with the advances in medical knowledge and the needs of the general practitioners? If the survey, discussed above, be utilized, it must be repeated at frequent intervals, perhaps every three to five years. Experience in its use will disclose the desirable frequency.

It is likewise true that curriculum formation cannot be separated completely from methods of teaching; the two are interdependent. The major technics of teaching (drill, problem and appreciation) are determined by the nature of the subject. It is obvious that the student should learn the various technics and skills, such as the performance of laboratory tests, the use of instruments, and the physical examination of the patient, by doing the same preferably in small groups under suitable supervision. The background of the foregoing and various facts not requiring the training of the senses can be learned from books and the spoken word, such as lectures, discussions, etc. There is a vast difference between listening and doing. Both have their indications and contraindications. We should not

13. Reid, W. D.: Loc. cit.
14. Simpson, V. E.: A Doctor Looks at Medical Service in Kentucky, *Kentucky Med. J.*, Jan., 1932.

forget that knowledge is best acquired when it is learned in as nearly as possible the conditions in which it is to be used in the future.

The medical curriculum should demonstrate less obsession with the subject and more concern for the student. It is the latter who is doing the learning. The student should be trained to study in such a way that it becomes a habit that will be continued after graduation from the medical school. It should not be expected that he will learn all of medical science, which is an impossible load. Rather, he should master the essentials and persistently add to these. In many respects no two students will acquire exactly the same knowledge while in medical school. The individual differences in students bring this about. The graduate may not know all about a particular subject; he will in all likelihood forget many details. Nevertheless, he should know the technic, and if properly trained, he will know how to secure the necessary information. He should be so trained that this "looking it up" becomes habitual.

Wilson[15] advocates that the necessary additions to the faculty consist chiefly of men of inspiration to replace those capable only of dogmatic instruction of undergraduates. Though the foregoing was written in regard to the education of graduate students, I do not feel it too much of an assumption to believe that Dr. Wilson would approve higher qualifications for the teacher of undergraduate students of medicine. For the achievement of the most successful education, Dr. J. B. Conant[16], president of Harvard University, places before all educational panaceas the possession of teachers distinguished for their investigations and their stimulating teaching.

SUMMARY

A tentative analysis of the objectives of undergraduate medical education is offered.

It is pointed out that many of these objectives do not indicate the introduction of a special course into the curriculum.

The difference between traditional and functional education is mentioned.

Repeated surveys of the work of the general practitioners are suggested.

The difference between major and minor facts is emphasized in the discussion of the content of the individual subjects.

The allottment of hours and the position of the subjects in the medical course is discussed.

15. Wilson, L. B.: The Function of the Graduate School in the Training of Specialists, abstr. *J.A.M.A.*, 98:1568 (April 30), 1932.
16. President's Report, 1932-33.

CONCLUSIONS

The primary objective of undergraduate medical education is vocational efficiency, i.e., the training of students for the general practice of medicine.

The curriculum should constantly be changing.

The curriculum and the method of teaching are interdependent; neither can be considered apart from the other.

The present tendency should be that of less obsession with the subject and more with the student; it is the latter who is doing the learning.

In so far as we can disabuse our minds of traditional thinking, it is believed that a restatement of the objectives of undergraduate medical education and a careful consideration of the information obtained by an adequate survey of the problems and needs of the general practitioners should give helpful guidance regarding improvements in the medical curriculum.

The Problem of Selecting Medical School Applicants

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Dr. Henry S. Houghton recently stated that, "the first problem of the new day of medicine is—the wise selection of fewer students."[1]

The premedical colleges are quite as much concerned that only the very best candidates be admitted to medical school as are the medical schools themselves. The premedical colleges have these applicants from two to four years, and it is our responsibility, together with that of the secondary school, to study and know the student so that we can be of greatest assistance to him in his choice and realization of a vocation. In the last analysis the problem is wider in its scope than merely trying to determine who should and who should not go to medical school, of admitting the most competent, and of turning away the less competent; but it is some one's task to assist these young people earlier in life in making better vocational adjustments.

Until such time as the problem of vocational adjustment is adequately cared for, premedical colleges and medical schools are attempting by one means or another to determine, if possible, which applicants are most likely to be successful in medical school and in medical practice in later life.

The medical aptitude test inaugurated by the Association of American Medical Colleges is an attempt to discover which applicants are the most promising.

The plan of the Association of American Medical Colleges of making reports to premedical colleges on the quality of work of students from their school should be of inestimable value in checking the judgment of those who have recommended the applicants. With our imperfect technique for evaluating personality and character traits, it is very difficult to give an adequate appraisal of each applicant. Such student progress reports as were recently sent to each premedical college will be of great assistance to us in evaluating what we have done and serve as a basis for more careful recommendations in the future.

The College of the University of Pittsburgh has worked out a system of recommendation for premedical students as follows. When a student applies to a medical school, his science teachers are usually asked to recommend him. It has frequently happened in the past that three science teachers were asked to write letters of recommendation for a student. These requests for information concerning a student in many cases came

1. DR. HENRY S. HOUGHTON: "The Challenge of the Future to Medical Education," *Science*, June 1, 1934.

to the instructor two or even three years after the applicant had been in his class. At such a late date the instructor found it quite difficult to give the medical school a just appraisal of the student.

In order to assist our students and also to give medical schools as complete and authentic a report on a student as is possible, rating sheets were prepared. These forms are carefully filled out by each science teacher at the time he has the student in class and the rating forms are then filed in the college personnel office. When a request for a recommendation is made, a copy of this rating form is sent from the college personnel office to the medical school requesting it.

This scheme results in the medical school being furnished the most authentic information possible on a student.

Another procedure which some medical schools employ and which assists the premedical colleges in their recommendation is—to wait until all students from a given premedical college have applied before asking for recommendations. When the requests for recommendation come in singly, it becomes a very difficult matter to rate and recommend individuals. Rating is largely a matter of comparing one applicant with other applicants. There are those who are obviously unfit and we should not hesitate to state this. However, individual applicants are relatively better or relatively worse than all others. It simplifies the problem of recommendation if the premedical college has a list of all the applicants to a single medical school and is asked to rank them in order of merit. Harvard Medical School makes use of this procedure. There may be others.

With the vast number of applicants from which to select, Dr. Fred C. Zapffe reports that 25 per cent of the students admitted to medical school fail to graduate. It is decidedly bad mental hygiene to have an individual start any course of study unless he has a reasonable chance of succeeding. It would seem that a program of closer cooperation between the premedical colleges and the medical schools could decrease the number of failures.

Two Years' Experiment in Psychiatric Teaching

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In this paper the social side of medicine, not psychiatry per se, is emphasized. There is nothing novel in the ideas back of this experiment, but putting these ideas into actual practice by the students is an experiment I have wanted to see carried out. We have had an opportunity of doing this in this school during the last two years.*

Each junior and senior student while on the psychiatric service (City Hospital, 40 beds) must carry out the following plan in respect to ward patients assigned to him.

1. Visit the family of the patient in the home.
2. Call the Social Service Exchange for the various welfare agencies interested in the patient.
3. Visit these agencies, read their records, and confer with the social workers active on the cases.
4. Make appointments with relatives at the Hospital to complete the history.
5. Make routine physical, neurological, laboratory and mental examinations.
6. Summarize the above material.
7. Present the case at a staff conference.

The first morning for each group on the psychiatric service is devoted to an explanation of what is required and to a discussion of the value to the general practitioner of the understanding of human relationships as shown by a first-hand study of the conditions in the family life of the patient.

Each student is urged to avoid all situations that might embarrass the Hospital or reflect in any way on the work. It is usually better for the student to go at once to the home of the patient as soon as he or she is admitted to the hospital and assigned. Relatives are usually more eager to cooperate at that time and expect less explanation and advice from the student. From the student's point of view, his mind at this time is more free to evaluate the physical and economic conditions of the home and the gross physical and mental abnormalities in other members of the family as they tell their story about the patient. The home visit is to give the student a "feel" of the entire situation rather than a list of facts.

*The work is carried on at the Louisville City Hospital, 500 beds. Mental cases are referred to the psychiatric service—a 40 bed wing of this general hospital. Students are assigned to the psychiatric service for approximately four weeks during their third and fourth year.

His interviews at the hospital with the relatives are more intelligent after he has done the physical and laboratory work, taken the patient's own story and obtained the information from social agencies. In the meantime, he will have formulated for himself a number of concepts about the patient and his family.

The student's next step following the home interview is to contact the Social Service Exchange and obtain a list of all the welfare agencies that have ever functioned on behalf of the patient and his family. The more important agencies are then visited, social workers active on the case are interviewed, and the record reviewed. Excellent cooperation has been obtained on the part of the agencies in this work. They tell us that physicians seldom call on them and, in general, know very little of their work. They have voluntarily shown the students about the agencies and have outlined their particular services to the public.

When this has been done, the student is usually armed with considerable information. This is even more illuminating because he has visited the family in the home. Having this bird's eye view of the entire setting, he can proceed to interview relatives at the hospital to complete the personal history of the patient and his disorder. By this time the physical and mental examinations on the patient have been completed. The student then summarizes the case. All the data are checked by a member of the staff before it is typed.

On the seventh day, or thereabouts, the student discusses the case before the student group and staff. The student may invite to the conference any social worker interested in the case. He then reads the summary. The diagnosis, prognosis, etiology, treatment and disposition are decided on and added to the summary.

Several things have surprised us in this undertaking. No real complaints have reached us as to the conduct of junior students in the home or at the hospital. A few students have failed to keep their appointments. In two instances we had to censure students for telling relatives early that there was nothing wrong with the patients when it later turned out that they needed state hospital care. However, on numerous occasions relatives have so appreciated a personal call from the doctor (student) that their attitude was completely changed toward the hospital. After the home visit, several difficult relatives were won over to the need for State Hospital commitment for the patient. Each of these relatives remarked that if the doctors on the Psychopathic Service were as interested as all that, they would cooperate in following recommendations given. We had expected a marked reaction on the part of some students against these home visits, but each group declared it meant more to them in under-

standing the patient than any other one thing. They paid their own car fare and frequently made night calls to catch more members of the family at home.

The reaction of the students to clearing through the Social Service Exchange for information was very interesting. Few students knew that such important organizations as the Family Service and Children's Agency existed. One went so far as to remark in a quiz that he now knew, after visiting the agencies, why this country did not have a revolution during this depression. Such unsolicited opinions as these at least show that students are thinking to some extent in terms of social stress and strain. Aside from the relief aspect of such organizations, the students were greatly impressed with the amount of important information these agencies had compiled through the years on individuals and their families. They frequently noted how inadequate and one-sided their histories from relatives by the question and answer method had been. More than once has a student made the initial history taken by the intern look very strange when he revealed another set of facts taken from the social agency records. The important point in all this is that the student benefits by making these discoveries for himself.

Last year's juniors followed practically the same procedure this year in their senior work on psychoneurotic cases referred from the medical and surgical wards of the City Hospital. In addition to this, the seniors can elect to make follow-up visits to homes of the patients assigned to them last year on the psychopathic Service. All have done this, although it has not been required. These interval histories have not only kept our records up to date, but also have enabled the students and staff to check the prognosis of a year ago and the effects of treatment, if such had been instituted.

Each student in his practical work studies thoroughly on an average of four psychotic cases during his junior service, four psychoneurotic patients during his senior service, and attends all the conferences on the other students' cases. In this way he has an opportunity of following about 30 cases of nervous and mental disease. In addition to this, he spends 10 hours in the child guidance clinic.*

So far this experiment of teaching medical students the social side of medicine along with psychiatry has not met with criticism on the part of relatives and has recommended itself favorably to the hospital staff and to the students.

I wish gratefully to acknowledge the valuable suggestions and wholehearted cooperation of Dean John Walker Moore and Dr. William E. Gardner, professor of psychiatry, in carrying on this work.

*Of course, didactic lectures in formal psychiatry are given to both junior and senior classes, but this paper emphasizes the practical work performed by the individual student.

An Introductory Course in Legal Medicine for Medical Students*

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Although legal medicine has been included in the medical curriculum of European universities for more than a century, it has been neglected almost entirely in the majority of medical schools of this country. With the increasing complexity of civilization, and the problems presented by congestion of urban areas, it is to be expected that a greater opportunity would be presented for the application of that portion of the medical sciences which is commonly classified as "legal medicine." This is true of the physician engaged in general practice in a sparsely populated community as well as of the one who is in residence as a specialist in a large hospital.

We wish to give a brief report of our experience in teaching an elementary course in legal medicine at the University of Illinois College of Medicine during the past three academic years.

The terms legal medicine, forensic medicine and medical jurisprudence are oftentimes used as though they were synonymous (Table 1), but, of course, this is not strictly true. To avoid misunderstanding by the loose application of these terms, it might be well to define them. Medical jurisprudence is the consideration of the laws of the land so far as they bear on medical subjects; it is primarily law rather than medicine. Matters pertaining to the contractual relations of physician and patient, the legal right, duties and liabilities of the physician with regard to his patient and the general public are, therefore, properly classified as problems of medical jurisprudence.

Legal medicine, or forensic medicine, on the other hand, is that portion of medical knowledge which may be of assistance in serving the needs of law and justice. It is often thought of as concerning the medical aspects of criminal offences, but it is also called on to render assistance in the adjudication of cases involving life and accident insurance, industrial compensation, soldiers' rehabilitation and other civil court actions.

Witthaus and Becker[1] define medico-legal science as including all sub-

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1. Witthaus, M. D., and Becker, T. C.: Medical Jurisprudence, Forensic Medicine and Toxicology, New York, 1909-1911.

TABLE 1. DEFINITIONS OF TERMS

	Dorland's American Illustrated Dictionary, 16th Ed., 1932.	Gould's Medical Dictionary, 3rd Ed., 1931.	Stedman's Practical Medical Dictionary, 12th Ed., 1933.	Funk & Wagnalls New Standard Dictionary of the English Language, 1929.	Webster's New International Dictionary of the English Language, 1930.
LEGAL MEDICINE	See Forensic Medicine.	Same as Forensic Medicine.	Medical Jurisprudence.	Same as Forensic Medicine.	Forensic Medicine: See medical jurisprudence.
FORENSIC MEDICINE	The application of medical knowledge to questions of law. Medical jurisprudence. Called also legal medicine.	Medical jurisprudence or medicine in its relation to questions of law.	Medical Jurisprudence.	Medicine as related to law; medical jurisprudence.	Medical jurisprudence.
MEDICAL JURISPRUDENCE	The application of the teachings of medical science to questions of law and justice; also the application of the principles of law to the relations between physicians and patients.	The application of medical knowledge to the principles of common law.	Medicolegal science, forensic medicine, the practical interrelation of law and medicine; the application of medical science to the determination of legal questions; the law in its bearing on the practice of medicine.	The branch of jurisprudence that pertains to questions, as concerning wounds, poisons, insanity and presumption of survivorship, requiring technical knowledge of the medical sciences for their elucidation and determination.	The science that treats of the relation and application of medical facts to legal principles; more properly though less commonly called forensic or legal medicine.
MEDICOLEGAL	Pertaining to medicine and law, or to forensic medicine.	Relating both to medicine and to the law.	Relating to both medicine and the law, or to medical jurisprudence.	Relating to the application of medical science to questions connected with the administration of justice.	(Not defined)

jects concerning which members of the legal and medical professions may seek information of one another, each acting in his professional capacity. It consists of two distinct branches: that treating of medical law, to which the designation of medical jurisprudence properly applies; and that relating to the application of medical knowledge to the purposes of legal trials—which is forensic medicine.

In a note to the introduction of the "Medical Jurisprudence" of Dr. Paris and Mr. Fonblanque (the first work produced by joint authorship of a physician and a lawyer, in 1823) is the following:

"Some authors have objected to the term Medical Jurisprudence, as implying a knowledge of the laws relating to medical topics, rather than an acquaintance with the medical science necessary for the elucidation of legal subjects. As it is our peculiar object to unite the sciences and to show their mutual relevance, the title becomes most applicable to this, although it may have been improperly affixed to former works."

Toxicology, the science of poisons, may be divided into medical toxicology, whose object is the prevention or cure of all forms of poisoning, and forensic toxicology, whose aim is the detection of criminal poisoning. In its last named relation, toxicology differs from forensic medicine in one important particular. In all cases other than those of poisoning in which questions involving medical knowledge arise, the answers are largely within the functions of the physician, the surgeon, or the obstetrician, but the problems of forensic toxicology require for their solution the further aid of the chemist and the pharmacologist.

The teaching of legal medicine in the medical schools in the United States reflects, in part, the general status of forensic medicine in their respective localities. Specific teaching along this line is usually listed under medical jurisprudence, state medicine, medical law, or legal medicine. In some schools the subject is combined with one or more subjects, and is described in the catalog as: Medical Jurisprudence, hygiene and preventive medicine; social hygiene, criminology and medical jurisprudence, ethics and economics; medical jurisprudence and toxicology; medical laws and ethics; history of medicine; medical ethics; medical jurisprudence and economics, and legal medicine. In some schools, the teaching falls to a department which takes a number of miscellaneous topics of supposedly minor interest, such as medical ethics, medical economics and medical history, etc. In a few schools the teaching is assigned to some major department as hygiene, public health and toxicology. Thus, the effects of poisons may be discussed in toxicology, medicolegal necropsies, in pathology, and the examination of blood and other stains in clinical microscopy, etc.

We have examined the latest issues of catalogs of 77 of the medical

schools in the United States. Of this number, 6.5 per cent gave a course in legal or forensic medicine; 58 per cent give lectures on medical jurisprudence; 35 per cent do not mention anything in the catalog in reference to these subjects. Instruction in medical jurisprudence and legal medicine does not, as a rule, exceed 16 hours. There are a few exceptions, one in particular which lists 30 hours for legal medicine and toxicology, and in a few instances the lectures on medical jurisprudence are given either by an attorney, or a physician, or an individual having both an M.D. and a law degree.

In many of our medical centers the medical school is so situated that cooperation may be had from non-medical organizations which are engaged in attempting to solve the problem of crime or to control it. These consist of the local and state police organizations, the office of the coroner or medical examiner, various sociological agencies and the local psychiatric investigators. The University of Illinois College of Medicine is rather fortunately situated in this respect. In immediate proximity are the Cook County Hospital with its divisions of pathology and psychiatry, the Cook County morgue with its medicolegal postmortem rooms, inquest rooms and laboratories for chemistry, toxicology and pathology functioning through the office of the coroner; and the Institute of Juvenile Research including the state criminologist and a staff of psychologists, psychiatrists and social workers, and the State Health Department laboratories specializing in bacteriology and serology. Within a short distance is Northwestern University's Crime Detection Laboratory which specializes in the more unusual aspects of criminal investigation, such as the identification of guns and bullets, the detection of deception, microscopy of hairs, fibers, etc., document examination and the use of ultraviolet light in investigational work. In the Cook County morgue 1,700 or more bodies are handled yearly by the coroner's physician, and of this number a postmortem examination is made of 750 or more bodies. Also, investigations of other coroner's cases which occur in the district total about 5,000 bodies a year, and of this number necropsies total about 1,500 bodies. Thus, the total number of bodies investigated by the coroner's office yearly is more than 6,500.

In the chemical laboratories, the chemical and toxicological examination of coroner's cases are undertaken for the entire county. These include chemical and serological tests of blood, and other stains.

These various organizations, embodying as they do the elements found in the modern European medicolegal institute, seem to offer an almost ideal situation for the instruction of senior medical students in the fundamentals of Legal Medicine. Special elective courses are offered covering the problems of forensic psychiatry and of medical jurisprudence.

So far as we have been able to ascertain, a required course in legal medicine is not offered by any medical school in the United States. Many medical curricula include courses in medical jurisprudence dealing chiefly with the legal rights and obligations of the physician. There are also courses in psychiatry with particular reference to its medicolegal applications. During the past few years some medical schools have undertaken to offer elective instruction in the field of legal medicine.

Schultz,[2] in his discussion of legal medicine in the United States, states, "In the academic year 1931-32 the Medical School of the University of Illinois inaugurated an optional lecture course in legal medicine for its senior students. This course is distinct from that in medical jurisprudence which has been offered for many years. The purpose of the course in legal medicine is to acquaint the student with some of the fundamental problems of forensic medicine which he is likely to encounter as a practitioner of medicine. Recognition of this course presents possibilities for the development of a university department of legal medicine in which ultimately it is to be hoped graduate instruction may be offered for those who may wish to specialize in legal medicine."

Sondern[3] states, "The various medical schools were appealed to for the establishment of postgraduate courses (legal medicine) of special instruction for the purpose of better qualifying such candidates. The fall of 1933 saw the opening of the first unit of this kind by New York University, University and Bellevue Hospital Medical College. These courses in forensic medicine will include a series of lectures to undergraduates during the second semester of the fourth year and additional elective courses for them in the various branches of this specialty." It should be mentioned that legal medicine has been taught at Harvard Medical School over a considerable period of years, and the first professor and the first endowed chair of legal medicine in this country was created in 1932 with Dr. G. B. Magrath as head.[4] Also, the scientific crime detection laboratory, which functions as a part of Northwestern University Law School, was established in 1929. It is obvious, therefore, that at Harvard University legal medicine has been taught to the medical students for a great many years and it is only comparatively recently that a few medical schools have attempted to give a course in forensic medicine and separated it from medical jurisprudence.

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2. Schultz, O. T.: Possibilities and Need for Development of Legal Medicine in the United States, etc., National Research Council, 1932, Bull. No. 87, p. 79; Present Status and Future Development of Legal Medicine in the United States, *Arch. of Pathology*, 1933, Vol. 15, (April), p. 542.
3. Sondern, F. E.: The Medicolegal Necropsy, *Amer. J. Clin. Path.*, Vol. 4 (Jan.) 1934, p. 2.
4. In March, 1934, the University of Michigan gave an intensive four day course in forensic medicine.

It seems apparent, then, that efforts have been made in various medical centers in the United States to establish courses in legal medicine. It is evident that the teaching of legal medicine is needed not only from the standpoint of education of medical practitioners, but to further the postgraduate training of men for this specialized field of medical science. In the field of public health and sanitation students receive lectures and demonstrations and are particularly informed as to the methods of control and reporting of communicable diseases. A similar situation does not exist in all medical schools in reference to legal medicine, in which students might be instructed in those duties which they may be called on to perform in connection with conditions which may arise as a result of crime and accident. It seems that a similar importance should be paid to the latter subject. Just as the knowledge gained from the subjects of public health and sanitation has opened opportunities which would make a medical graduate wish to elect a career as a medical health officer, and that facilities for obtaining such an education and training are made available to him, so must the medical student be informed of what constitutes a medicolegal problem, and facilities should be made available to him for subsequent study of accidents from industrial hazards, asphyxiation by gaseous poisons, electrical injuries, etc., the means of preventing these conditions and increasing the safety of the workmen. For example, during 1933, in Cook County, the population was 4,091,500 and the total death rate for all causes of death was 41,181, or 9.83 per 1000. Deaths from reportable diseases were 6,150, or 1.5 per 1000. In contrast to this the total number of cases during 1933 handled by the coroner's office was 6,500. It seems obvious, therefore, that the physician should be equally familiar with what constitutes a medicolegal case, and the proper manner of handling it, as he is in reporting communicable diseases. The knowledge derived from the teaching of forensic medicine should also embrace the legal profession. The cooperation of various scientific crime detection agencies with the law governing bodies in a central unit will bring about a great advance in the knowledge of crime detection instead of individual units working as such. These should be coordinated so that the best benefits will be derived and will aid the state and the country in detecting and controlling crime.

In 1931, when we started our course in legal medicine, we gave a series of 16 lectures and demonstrations. Although the subjects mentioned in Table 2 may not be representative of the best that could be chosen for a 16 hour course, it nevertheless gives the students a conception of legal medicine.

TABLE 2. LIST OF LECTURES

1. Introductory lecture: Problems of Legal Medicine, Jurisdiction of Coroner and Medical Examiner. Cases of Sudden Death.
2. Literature of Legal Medicine.
3. Laws Governing the Dead Human Body.
4. Personal Identification.
5. Medicolegal Necropsy.
6. Death from Burns and Electricity.
7. Traumatic Injuries and Fractures.
8. Identification of Guns and Bullets.
9. Rape and Abortion.
10. Asphyxial Death.
11. Homicidal and Suicidal Poisoning.
12. Industrial Poisoning.
13. Medicolegal Aspects of Alcoholism.
14. Examination of Blood, Stains and Fibers.
15. Psycho-Physiologic Methods for the Detection of Deception.
16. The Medical Expert in Court.

SUMMARY OF COURSE IN LEGAL MEDICINE.

In the introductory lecture, the subject of the jurisdiction of the coroner's office and that of the medical examiner is discussed, the two systems are compared and the duties of a physician are explained in cases of death from unexpected, unnatural or unknown causes. The general subject of the pathology of sudden death is dealt with, particularly with regard to the requirements of legal proof.

In the second lecture, the extensive and somewhat scattered information concerning legal medicine is gathered together, particularly with refrence to standard texts and monographs, as well as to scientific literature in medical and legal journals. The practical use of the medical library in locating such information is demonstrated.

The laws governing the dead human body and various jurisdictions are discussed, particularly with reference to the right of the coroner or medical examiner to order a necropsy in ordinary cases. Consideration is also given to questions of property rights of dead bodies, cremation, and exhumation. While this strictly falls into the category of medical jurisprudence, it is of such importance in the legal conduct of necropsies, that it seems wise to include it.

The identification of bodies through photography, finger-printing, location of scars and other marks, X-rays and anatomical measurements are discussed. The estimation of age and ethnic derivation of a badly decom-

posed body through the application of anatomy and anthropology is demonstrated. The use of dental roentgenograms in the identification of badly burned, decomposed or mutilated bodies is dealt with.

A combined lecture and demonstration is given on the technic of performing the medicolegal necropsy. Death from burns and electricity, and also from traumatic injuries and fractures are discussed, particularly with reference to their medicolegal implications. One period is devoted to the medicolegal aspects of rape and abortion. Specimens are available in the pathological museum to give actual illustrations of such cases. One hour is devoted to the identification of bullets with respect to the locating of a gun which fired these bullets (miscalled forensic ballistics). This is comparatively a new science and one which has been used very effectively in the investigation of deaths from gunshot wounds.

In the discussion of asphyxial death, various types of physical asphyxia, such as hanging, strangling, choking and drowning are taken up and also chemical types, such as poisoning by carbon monoxide and other asphyxiant gases. Two periods are devoted to considerations of other poisons used for homicide or suicide and also for those poisonous substances which are characteristically met with in industrial processes. Alcoholism, both fatal and nonfatal, is given consideration, particularly with reference to medicolegal problems involving death or alcoholic intoxication. Drunkenness is often a factor in questions of contributory negligence, and the evaluation of the extent of alcoholic intoxication is of vital importance in medicolegal questions of responsibility for accidents. Examination of blood stains for their species-specificity and also for their grouping characteristics is discussed, along with the microscopy of other stains, hairs and fibers.

One of the most promising fields of investigational work is the use of psycho-physiological technics in the detection of deception. The continuous recording of blood pressure, pulse and respiration during the questioning of a subject reflect emotional changes which indicate untruthful answers. During the past four years, the method has been used with remarkable effectiveness and we are fortunate in being located in the center for such research and to include a lecture on the subject in our course.

Finally, the behavior of the medical expert on the witness stand is discussed. All too frequently otherwise competent medical testimony is rendered ineffective by a physician's ignorance of the simple principles of courtroom psychology. As the final lecture of the series, such a presentation seems apropos.

As an elective subject, the course has been quite popular with medical students and it has been necessary to restrict the class to a limited number of senior medical students to keep out those who are idly curious.

SUMMARY

1. The question of legal medicine and medical jurisprudence is discussed, and it is shown that the former subject is not given sufficient place in medical curricula. It is evident that a wide range of methods in the teaching of legal medicine and medical jurisprudence exists at present among the medical schools in the United States.

2. An outline and a short discussion of an introductory course in legal medicine as instituted in the University of Illinois College of Medicine is given.

3. We have attempted to emphasize the importance of legal medicine because of its applicability in the almost routine work of the physician and the assistance he may give to the law enforcing bodies.

4. It is hoped that a closer cooperation between the medical, legal and sociological divisions as a single functioning unit will better aid the state and country in not only controlling crime but in preventing it.

5. A university department of legal medicine with the instruction of undergraduate students of medicine in the fundamental problems of legal medicine that they are apt to encounter in their professional work after graduation should be made available to all students. Similar courses should be offered to the students of the university school of law.

6. It is also recommended that institutions be made available for the training of graduates in medicine and law for careers in legal medicine.

Clinical Teaching for the First and Second Year Classes

JOHN A. KOLMER
Professor of Medicine, Temple University School of Medicine
Philadelphia

The modern tendency in medical education is to start clinical teaching in the first and second years. This gives the student at the outset the all embracing sense and realization that he is, in fact, a student of medicine; that what he is being taught in the "dry" subjects of anatomy, physiology, bacteriology and chemistry is of practical importance as well as stimulating to his curiosity along with an opportunity for gradually acquiring a knowledge of medical terminology. But what is probably most important of all is an early opportunity to acquire clinical experience and an early start in learning how to deal properly with the sick and injured.

To have the students observe how eagerly the clinical teachers draw on their knowledge of the fundamental sciences in the every day practice of medicine, and, incidentally, to express, from time to time, their envy of the opportunities afforded students for acquiring even more knowledge of them, cannot fail to carry conviction of the value of instruction in the preclinical subjects.

It is true, as stated by Pepper[1], that certain difficulties confront the teacher. Probably the most difficult problem is to have available suitable cases as they are required for clinics, but by drawing on all services and departments in the hospital, as well as on the outpatient clinics, it is usually possible to solve this problem successfully, providing the courses are well planned far in advance. Furthermore, the teacher must be careful to use the simplest language and be willing to pause for the explanation of new terms, but after all, the teaching of terminology is one of the purposes of the instruction. On the other hand, the clinical teachers are greatly benefited themselves because of the necessity for meeting the deeper and more detailed knowledge the students are apt to possess in bacteriology, immunology, chemistry, physiology and anatomy. Indeed, the course of instruction is mutually helpful to both student and clinician and greatly helps the latter in his teaching of the upper classes.

Of course, the details of physical diagnosis cannot be stressed in clinics for the first year class but have a direct bearing on those for the second year class since instruction in physical diagnosis is given during this year. But it is always possible to select cases from which much can be taught

1. PEPPER, O. H. P.: Experiences with Medical Clinics to the First Year Classes. *J. Amer. Med. Assoc.*, 1924, 82, p. 1632.

by inspection and palpation without recourse to the intricacies of percussion and auscultation. And so much bacteriology, hematology, etc., are now being taught in premedical courses that even first year students find little difficulty in following the results of routine clinical laboratory examinations.

CLINICS FOR THE FIRST YEAR CLASS

At Temple University School of Medicine a clinic of one hour is given in the hospital each week throughout the scholastic year. These clinics are devoted to bacteriology, parasitology and immunology since lectures and laboratory instruction in these subjects is given during the first semester, and as far as possible the clinical material is selected to follow closely the laboratory instruction. Emphasis is placed on the manifestations of the disease along with explanations of their production. The teacher frequently pauses to ask questions which never fail to arouse interest. The history of each case is presented briefly, and even a few general remarks are made in conclusion on the principles of treatment.

Since the majority of the students have had some instruction in the primary principles of immunity in their premedical course the first two clinicians are devoted to active immunization in order to prepare the students for an understanding of vaccination against smallpox, the Schick and Dick tests and vaccination against diphtheria, scarlet fever and typhoid fever since it is our policy at Temple to include these on all students during the first year as part of their health examinations. These are followed by clinics on fever and other general manifestations of infection and the mechanism of their production while the students are receiving lectures and laboratory instruction on the general principles of bacteriology. These, in turn, are followed by cases of staphylococcus, streptococcus, pneumococcus and other bacterial and protozoan diseases as the various parasites are being discussed in the laboratories.

Probably I can best describe our course by summarizing the clinics which I gave during the college year 1933-1934 in cooperation with the lectures and laboratory instruction of Professor Fanz and Dr. Gault:

1. A clinic on the technic of cowpox vaccination. Presentation of cases showing various stages of vaccinia and the immunity reactions in previously vaccinated individuals.

2. A clinic on the technic of Schick and Dick tests with the presentation of positive, pseudopositive and negative reactions.

3. A clinic on the technic of administering diphtheria, typhoid and other vaccines.

4. A clinic on different types of fever due to infections including the technic of taking temperatures and a discussion of the mechanism of fever.

5. A clinic on pulse changes and the technic of taking the pulse as well as blood pressure readings including a discussion of the effects of fever and infection. In these two clinics other manifestations of acute infections are also shown as the dry tongue and skin and the mechanism of their production; pupillary and mental changes, etc., with cases of streptococcus septicemia, tuberculosis and the like.

6 and 7. Clinics on staphylococcus infections as pimples and stitch abscesses; furunculosis; carbuncles; osteomyelitis; nasal accessory sinusitis, etc.

8, 9 and 10. Clinics on streptococcus infections as puerperal sepsis, cellulitis and lymphadenitis, mastoiditis, meningitis, erysipelas, tonsillitis, septic pneumonia, subacute bacterial endocarditis, etc.

11. A clinic on focal infection with cases of peri-apical infections of the teeth with roentgenograms; chronic tonsillitis, rheumatoid arthritis, rheumatic heart disease, etc.

12 and 13. Clinics on pneumococcus infections with cases of lobar pneumonia and demonstration of positive blood cultures, agglutination tests for typing, etc.

14. A clinic on the "common cold" and influenza.

15. A clinic on meningococcus meningitis with demonstration of spinal fluids, technic of spinal functure and intraspinal injections of serum.

16. A clinic on gonococcus infections with cases of acute and chronic urethritis; pyosalpingitis; infantile vaginitis, etc.

17. A clinic on chronic wound infections with bacillus pyocyaneus.

18. A clinic on bacillus coli infections with presentation of cases of urinary tract infections.

19. A clinic on typhoid fever with demonstration of agglutination tests, etc.

20. A clinic on tuberculosis with cases of acute and chronic pulmonary tuberculosis, tuberculosis osteitis and arthritis, etc.

21. A clinic on the technic of cutaneous, intracutaneous and subcutaneous tuberculin tests with cases showing positive and negative reactions.

22 and 23. Clinics on syphilis with cases of chancre, aneurysm with x-ray films, tabes dorsalis and paresis along with a demonstration of positive and negative Wassermann reactions, colloidal gold curves, etc.

24. A clinic on diphtheria and tetanus in which inoculated guinea pigs were used as cases were not available at the time. Presentation of a case of gangrene following amputation.

25. A clinic on anthrax with a case of malignant pustule.

26. A clinic on acute anterior poliomyelitis.

27. A clinic on amebic enteritis and dysentery with cases.

28. A clinic on trichiniasis with cases which happened to be available; also a case of infestment with taenia saginata with a demonstration of the parasite.

29. Methods for conducting skin and conjunctival tests for serum allergy with the production of acute anaphylactic shock in guinea pigs; methods for conducting skin tests in hay fever and asthma.

CLINICS FOR THE SECOND YEAR CLASS

For this class the clinics were devoted to pathological physiology following the instruction given by Prof. Hickey in normal physiology in the second semester of the first year and the first semester of the second year as well as to physiological chemistry in conjunction with the course in clinical chemistry given by Professor Saylor during the second year.

They were divided among different members of my staff according to their special fitness for teaching the subjects assigned. In every clinic the purpose was to demonstrate clinical manifestations and attempt to explain them in terms of altered physiology and physiological chemistry. Somewhat more stress was also laid on the elicitation of signs of disease by the methods of physical diagnosis. The course can best be explained by giving a synopsis of the clinics given during the college year 1933-1934 at weekly intervals of one hour each:

1, 2, 3 and 4, by Professor Kolmer and Dr. Louis A. Soloff on diseases of the blood with cases of secondary anemia of various causes; pernicious anemia; acute and chronic leukemias; leukopenias and leukocytosis of various causes; agranulocytosis; the purpuras; polycythemia and hemolytic jaundice.

5, 6, 7, 8, 9 and 10, by Dr. Hugo Roesler on the pathological physiology of the heart and blood vessels with cases of rheumatic heart disease; dyspnea (cardiac asthma) and edema of the lungs, etc., mitral stenosis; cyanosis and clubbing of the fingers due to heart disease; cardiac pain; the influence of muscular activity on the circulation; the problem of neurocirculatory asthenia; the cardiovascular changes in thyrotoxicosis; tachycardia and the arrhythmias; hypertension and hypotension; the dynamics of the heart muscle and causes of cardiac weakness; demonstration of heart murmurs with the multiple stethoscope and the mechanism of their production along with x-ray films, electrocardiographic tracings, etc.

11, 12 and 13, by Professor Kolmer on the pathological-physiology of the respiratory system with cases of disturbances of respiration and acid-base equilibrium; diminished oxygen carrying capacity of the blood in the anemias and carbon monoxide poisoning; cases of allergic asthma and emphysema; cases of pleural effusion, pneumothorax, pulmonary infarction, hemoptysis, etc.

14, 15, 16, 17, 18 and 19 on the pathological physiology of digestion with cases presenting subacidity, achlorhydria, achylia, hyperacidity, hypersecretion, peptic ulcer and functional disturbances of the colon, by Dr. William A. Swalm; vomiting, by Dr. Charles Francis Long; gall bladder, bile passages and jaundice, by Dr. Robt. F. Sterner.

20 and 21 on diabetes mellitus, by Dr. Reuben Davis with blood chemistry and urinary changes; disturbances of acid-base equilibrium and of carbohydrate, protein and lipoid metabolism; the action of insulin, etc.

22, 23, 24 and 25 on the pathological physiology of the kidneys, by Dr. Edward Weiss with cases presenting polyuria and oliguria; uremia; salt and water retention with edema; different clinical types of acute and chronic nephritis; renal calculi and pain, etc.

26, 27 and 28 on metabolic diseases and the pathological physiology of the endocrine glands, by Dr. Michael G. Wohl wtih cases presenting disturbances of purin metabolism; obesity; exophthalmic goitre; pituitary and parathyroid gland disturbances; ovarian dysfunction, etc.

Here, again, the policy has been to not only point out such clinical manifestations as may be demonstrated to a whole class but also to ask numerous questions covering previous instruction by Professor Hickey, Professor Saylor and their associates and in this manner have the students themselves work out acceptable explanations of the manifestations as far as possible while concluding each clinic with at least a brief reference to the principles of treatment.

If one may judge from the interest displayed by the great majority of the students of both classes and particularly their eagerness to see the symptoms and signs of disease in relation to the hard work required of them in their laboratory courses, one cannot escape the conclusion that the courses are worth while and highly appreciated. But it is necessary and advisable to give real clinics with illustrative cases rather than clinical lectures.

Association of American Medical Colleges Program for the Forty-fifth Annual Meeting to be Held in Nashville, October 29-31, 1934

MONDAY, OCTOBER 29

At Vanderbilt University School of Medicine

Plea for Closer Cooperation Between Boards of Licensure and the Association of American Medical Colleges

H. M. PLATTER, Secretary Ohio State Medical Board.

Discussion to be opened by DR. I. S. METZGER, President Pennsylvania State Board of Medical Education and Licensure.

General discussion.

Inspection of Medical Schools and Survey of Medical Education

RAY LYMAN WILBUR, Chairman Council on Medical Education and Hospitals, American Medical Association.

Discussion.

Clinical Clerkships for Juniors

C. W. M. POYNTER, Dean College of Medicine, University of Nebraska.

Discussion.

Relationship of Histology to Pathology

C. C. MACKLIN, Professor of Anatomy, University of Western Ontario Faculty of Medicine.

On the Pedagogic Integration of the Divisions of Anatomy

OTTO F. KAMPMEIER, Professor of Anatomy, College of Medicine, University of Illinois.

Discussion of papers by DRS. MACKLIN and KAMPMEIER.

TUESDAY, OCTOBER 30

At Vanderbilt University School of Medicine

Report of Committee on Aptitude Test

F. A. MOSS, Secretary of Committee.

Discussion.

Effect of the Depression on Medical Students of the Negro Group and on Internships Available

JOHN J. MULLOWNEY, President Meharry Medical College.

Discussion.

Symposium by Members of the Faculty of Vanderbilt University School of Medicine

I. Methods and Objectives in the Organization of the Outpatient Department of a Teaching Hospital.—Dr. C. Sidney Burwell.

II. Coordination of the Fundmental Sciences and Clinical Branches in the Diagnosis and Treatment of Disease.—Dr. Barney Brooks.

III. Correlation of Departmental Activities in the Instruction of Medical Students—Dr. W. S. Leathers.

IV. Advantages Gained from the Cooperation of Several Departments in Research Programs.—Dr. R. S. Cunningham.

WEDNESDAY, OCTOBER 31

At Meharry Medical College

Symposium on Graduate Teaching

Graduate Teaching from the Specialist's Viewpoint.—W. McKim Marriott, Dean and Professor of Pediatrics, Washington University School of Medicine.

The Department of Regional Extension of the Albany Medical College, with Particular Reference to Graduate Instruction.—Thomas Ordway, Dean and Professor of Medicine, Albany Medical College.

The Relation of the Medical School to Extension Postgraduate Medical Instruction.—Leroy E. Parkins, Secretary to Courses for Graduates under the Commonwealth Fund.

Current Trends in Graduate Medical Education.—Willard C. Rappleye, Dean Columbia University College of Physicians and Surgeons.

Experience with a Postgraduate Course for Practitioners: Evaluation of Results.—John B. Youmans, Director of Postgraduate Instruction, Vanderbilt University School of Medicine.

Are Short Courses in Graduate Schools Worth While?—Frank R. Ober, Assistant Dean Harvard University Medical School.

Dinner Monday evening at 6:30, at Hotel Andrew Jackson. President's address and address by Chancellor J. H. Kirkland, of Vanderbilt University.

Dinner Tuesday evening at 6:30, followed by executive session.

Luncheon Monday and Tuesday at Vanderbilt University. Luncheon Wednesday at Meharry Medical College.

Headquarters: Hotel Andrew Jackson.

JOURNAL
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Forty-fifth Annual Meeting

The forty-fifth annual meeting of the Association of American Medical Colleges will be held in Nashville, Tennessee, October 29-31, 1934.

The hosts for this meeting are Vanderbilt University School of Medicine and Meharry Medical College. One session will be held on each day, beginning at 9:30 a. m. and ending about 12:30 p. m. The sessions on the first and second day (Monday and Tuesday) will be held at Vanderbilt; the session on the third day (Wednesday) will be held at Meharry. The program for each of the sessions is printed on pages 293 and 294 of this issue.

The Hotel Andrew Jackson has been selected for headquarters. Owing to the generally prevailing low, less than one fare, railroad rates, it was not necessary to make any attempt to secure the usual one and one-third fare convention rate. Those planning to attend the meeting should ask for excursion tickets.

Arrangements will be made by the local committee for transportation of delegates and others from the hotel to the place of meeting on each day. Luncheon will be served at place of meeting immediately after the conclusion of each session.

The afternoons of each of the three days will be spent in visiting the medical schools at which meetings are held.

On Monday evening, the usual informal dinner will be served at the Hotel Andrew Jackson. The speakers on this occasion will be the president of the Association and Dr. J. F. Kirkland, chancellor of Vanderbilt University.

The Executive Session will be held on Tuesday, at the Hotel Andrew Jackson at about 8 p. m., and will be preceded by dinner at 6:30 p. m.

Every one who is interested in the work of the Association or in medical education and teaching in general, is cordially invited to attend the meeting and to participate in the discussions on the papers read. Attendance on the Executive Session is optional for those who are not official delegates, but only official delegates may vote when occasion demands voting.

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Detection of Fraud

On many occasions the office of the Association has aided to a considerable degree in supplying information leading to the confirmation of the practice of fraud by transferring students. The data on file have been added to year by year until a mass of information has been acquired which has never failed to be helpful to medical school executives.

The need for housing these data has made it necessary to enlarge the office space to more than twice the space occupied during the past two years, making a highly creditable showing. It also speaks for the constantly increasing recognition of the work of the Association in the field of medical education and its value to every contacting agency both in this country and abroad. Visitors are most welcome at all times.

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Portraits of Officers

A most interesting exhibit is the gallery of photographs of presidents and secretaries, living and deceased, who have served since the organization of the

Association in 1890. This gallery is now complete except for the photograph of one ex-president which has not yet been received but has been promised. These photographs are suitably framed and are an adornment of wall space.

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Inspection of Medical Schools Planning Committee

The following "Planning Committee" has been appointed by Dr. Ray Lyman Wilbur, chairman of the Council on Medical Education and Hospitals of the American Medical Association for the purpose of making a layout for the inspection of medical schools and survey of medical education in which the Council, the Federation of State Medical Boards and the Association of American Medical Colleges will participate: Dr. Reginald Fitz, chairman; Dr. W. C. Rappleye; Rev. Alphonse M. Schwitalla; Dr. W. S. Leathers; Dr. Harold Rypins and Dr. Dean Lewis. This committee will make the rules and regulations and plan the procedures for action under which the inspector, Dr. H. G. Weiskotten will work and according to which a final report will be prepared.

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College Hours and Course Content

From time to time the question has been raised whether admitting officers of medical schools may accept a 6 hour credit in physics or biology in lieu of the usual 8 hour credit.

The present requirements of the Association call for a year's work in each of these subjects, no mention being made of hours. It is presumed that the various college accrediting agencies have taken steps to insure that the course content in either case is the same. Some colleges accredit 6 hours, some 8 without variation in course content. Therefore, the course content is the important item for consideration and should govern acceptance of the credit. A year's course in either subject which is acceptable to college accrediting agencies must mean a full year of work. If the course is not acceptable because of its not representing a full year of work, it cannot be accepted as such.

The Executive Council of the Association passed a ruling to that effect at its recent meeting in Cleveland for the guidance of admitting officers.

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James S. McLester

Dr. James S. McLester, a member of the Council on Medical Education and Hospitals of the American Medical Association, a well known member of the medical profession and professor of medicine in the School of Medicine of the University of Alabama, was elected president-elect of the American Medical Association at the annual meeting held in Cleveland in June. Dr. McLester has been greatly interested in medical education for many years, hence it is to be expected that he will take an active part in the coming survey of medical education and the inspection of medical schools. This is a most fortuitous choice at this time.

College News

University of Chicago
Division of the Biological Sciences

Dr. Warren B. Matthews who has received a Ph.D. in surgery, has been awarded the Lucius Littauer Fellowship at Harvard for 1934-35. He begins his work in the cancer clinic at the Collis P. Huntington Memorial Hospital in Boston.

Dr. Tomio Ogata, lecturer in serochemistry in the Medical Department of Tokyo Imperial University, is working in the Department of Pathology and the Sprague Institute, as a holder of a Rockefeller Foundation Fellowship.

Dr. George William Bartelmez has been appointed to succeed Dr. Herrick as chairman of the department of anatomy. Dr. Herrick becomes professor emeritus this year but has accepted the president's assignment to continue special work in the department next year.

PROMOTIONS: Dr. M. Edward Davis, to associate professor of obstetrics and gynecology; Dr. Lowell T. Coggeshall and Dr. Theodore E. Heinz, to assistant professor of medicine; Dr. H. Close Hesseltine and Dr. Frank E. Whitacre to assistant professor of obstetrics and gynecology; Dr. Norman Hoerr, to assistant professor of anatomy; Dr. Harry L. Huber to associate clinical professor of medicine.

Dr. Max Cohn of Berlin has been appointed as an Honorary Lecturer in Roentgenology and Dr. Rudolph Schindler of Munich has been appointed as Visiting Professor of Medicine.

DOUGLAS SMITH FOUNDATION FELLOWSHIPS: Dr. Heinrich Kobrak has been appointed Research Assistant in Surgery. He will assist Dr. Lindsay on experiments to produce lesions of the middle and inner ear. Dr. B. H. Blockson, Jr., will work for the next year with Dr. C. B. Huggins on ostegenesis. Dr. Hans Aronsohn will work during the next year with Dr. Edmund Andrews on the biliary system.

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St. Louis University
School of Medicine

Opportunity is offered for graduate study in the medical basic and clinical sciences. Two separate plans are followed. The first plan contemplates the offering of opportunities for its students who desire to secure advanced master's and doctor's degrees in the basic medical sciences and the second to those students who desire to secure an advanced degree in one of the clinical sciences.

The requirements for the first group of graduate degrees include the Bachelor of Arts or Bachelor of Science degree with preliminary undergraduate courses acceptable to the director of the department in which the student desires to pursue the subject. Personality qualities are insisted on, and preference for appointments is given to those who desire to follow a career as instructors in particular basic medical sciences. The basic stipend is $300 a year and freedom from tuition and fees. The stipend, however, will vary with the qualifications and previous experience of the appointee and with the amount of time he devotes to departmental duties.

The graduate fellowships in the clinical sciences were organized by the university a few years ago to give opportunities to young physicians to prepare themselves for specialization in internal medicine, surgery, gynecology and obstetrics, pediatrics and, after the next session, in otolayngology and ophthalmology as well. The prerequisites for appointment are the completion of the regu-

lar four year school of medicine curriculum in an acceptable school and the further completion of a year's rotating internship. Appointments to the fellowships are given for three years and the student is expected to commit himself to the entire program at the time when he accepts the appointment. For fellowships in otolaryngology and ophthalmology there will be required, in addition, the completion of a year's residence in surgery in an approved hospital, and the special curriculum will be one of two years.

Opportunity is given to all of the students holding such appointments to complete the requirements of the Graduate School for the Master's Degree in the respective field of specialization. Among these requirements is also the completion of a curriculum fixed as to program, but variable as to content, depending on the special interests of the student as guided by the respective departmental directors. These fellowships number twenty for the coming year.

Up to the present, the stipend for the first year graduate fellow is $360; for the second year graduate fellow, $480, and for the third year graduate fellow, $660, in addition to exemption from payment of board, lodging and tuition. In addition to these fellowships, the University has available the Eli Lilly Research Fellowship in Internal Medicine, the Carl Barck Visiting Fellowship in Ophthalmology; the Parke Davis and Company Fellowship in Endocrine Research and two Mead-Johnson Fellowships in Pediatrics.

Further details concerning these fellowships may be found in the announcements of the Graduate School and the School of Medicine of St. Louis University.

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Western Reserve University School of Medicine

Dr. Howard T. Karsner, Director of the Institute of Pathology, will attend the triennial conference of the International Society for Geographic Pathology, meeting in Utrecht, Holland. Later he will visit laboratories in London and Cambridge, England, Hamburg and Freidburg, Germany, and Strasbourg in France.

President Winfred G. Leutner announced the receipt of grants totaling $8,500 annually for two years to the School of Medicine of Western Reserve University for extension of work in experimental pathology. Three thousand dollars will be contributed annually by Nathan G. Richman and Charles L. Richman of Cleveland; $500 annually by Richard H. Kohn of Cleveland. The remaining $5,000 will come through Nathan L. Dauby and Morton J. May, trustees of a charity trust created through the generosity of Commodore Louis D. Beaumont, a former Clevelander, one of the founders of the May Company, now residing abroad.

These sums, President Leutner said, will be used for the prosecution of further work by Dr. Harry Goldblatt, associate professor of pathology, and his assistants, especially on study of high blood pressure and peritonitis, and other investigations of the same general nature, to be carried on in the Institute of Pathology of Western Reserve University.

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University of California Medical School

PROMOTIONS: E. L. Munson, lecturer in preventive medicine and public health to professor of preventive medicine; E. B. Shaw, assistant clinical professor of pediatrics to associate clinical professor of pediatrics; N. Shock, research associate in physiology to assistant professor of physiology; H. H. Anderson, instructor in pharmacology to assistant clinical professor of pharmacology; K. O. Haldeman, instructor in orthopedic surgery to assistant clinical professor of orthopedic surgery; H. D. Crall, assistant in urol-

ogy to instructor in urology; A. H. Heald, assistant in roentgenology to instructor in pathology and roentgenology; F. Kellogg, assistant in medicine to instructor in medicine.

NEW APPOINTMENTS: R. D. Friedlander and H. M. Hand, instructor in medicine; A. J. Bayley, professor of medical military science and tactics; Frances Baker, instructor in orthopedic surgery; F. G. Novy, instructor in dermatology; C. C. Odom, lecturer in psychiatry.

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Temple University School of Medicine

The degree of doctor of medicine was conferred on 118 members of the senior class at the commencement exercises held June 15.

Honorary degrees were conferred on Joseph B. Eastman, Federal Co-ordinator of Transportation; Dr. William D. Gordon, State Secretary of Banking and the Rev. Dr. William L. Sullivan, pastor, Unitarian Church of Germantown, Dr. Robert C. Clothier, president of Rutgers University, the Rt. Rev. Philip Cook, Bishop of the Episcopal Diocese of Delaware, James M. Hepbron, managing director, Criminal Justice Commission, Baltimore; Edward W. France, director, Philadelphia Textile School, Rev. John C. Ball, pastor, Metropolitan Baptist Church, Washington, D. C.

NEW APPOINTMENTS: Dr. Morris Franklin, instructor in junior surgery.

PROMOTIONS: Dr. Harry Z. Hibshman from clinical professor to professor of proctology; Dr. Gerald H. J. Pearson, from lecturer to associate in pediatrics; Dr. Henry H. Perlman, from demonstrator to lecturer in pediatrics; Dr. Edward D. Atlee from instructor to demonstrator in pediatrics; Dr. Charles R. Barr, Dr. Robert S. Heffner and Dr. Joseph Levitsky, from clinical assistants to instructors in pediatrics; Dr. C. Kenneth Miller from clinical assistant to instructor in obstetrics.

Emory University School of Medicine

Members of the faculty delivered a series of ten lectures at Carrollton, July 9-13, under the auspices of the extension department of the university and supervised by the state board of health.

CADUCEUS, an honorary medical society of Emory University School of Medicine, this year inaugurated a new plan: that of having an annual dinner at which a well known physician would be invited their friends. May 17, the guest speaker was Dr. Claude S. Beck, associate professor of surgery in the School of Medito speak to members of the society and cine of Western Reserve University.

Dr. Beck spoke on two subjects related to the heart: "The Surgical Relief of Adhesive Pericarditis" and "Contusion Wounds of the Heart." His talks were intensely interesting.

In addition to the members of CADUCEUS many of the students and faculty were present. In 1930, Dr. Beck spent a week at this school as visiting professor of surgery. He is, therefore, well known to the school and members of the profession in Atlanta and every one appreciated the honor of having him present his work.

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University of Louisville School of Medicine

An amalgamation of the bacteriological laboratory of the City of Louisville with the bacteriological laboratory of the Louisville City Hospital (affiliated with the University of Louisville School of Medicine) has recently been effected. Dr. James A. Kennedy, formerly of the University of Rochester School of Medicine and the University of Georgia School of Medicine, has been made director of these laboratories, and associate professor of bacteriology in the University of Louisville School of Medicine.

Dr. Harry Andrews, instructor in pediatrics in the University of Louisville School of Medicine has been made Director of Service of the Children's Free Hospital, affiliated with the University of Louisville School of Medicine.

Dr. Spafford Ackerly, associate professor of psychiatry, spent the month of July at the Riggs Sanatorium, Stockbridge, Massachusetts, as visiting pyschiatrist.

OTHER APPOINTMENTS: Margaret Limper, M. D., instructor in pediatrics; Lincoln Fisher, M. D., clinical instructor in surgery; Paul G. Roofe, B. S., Ph.D., assistant in anatomy; Chapman S. Moorman, B. S., M. D., clinical assistant in urology; Harry D. Bruner, B. S., M. D., and Joseph L. Goldstein, A. B., M. D., assistant in physiology; Harold Heuser, M. D., clinical assistant in medicine.

PROMOTIONS: Alice N. Pickett, M. D., associate professor of obstetrics; William T. McConnell, B. A., M. D., associate clinical professor of obstetrics; W. O. Johnson, B. S., M. D., assistant clinical professor of gynecology; Robertson Joplin, M. D., instructor in surgery.

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Woman's Medical College

Announcement is made that applicants for admission to the college in September, 1935, will be required to present evidence of completion of at least three years of college work. Special consideration will be given to students possessing unusual ability or when equivalent training may warrant exceptional action.

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Tulane University of Louisiana School of Medicine

The 1934 graduating class numbered 122. During the year the Commonwealth Fund appropriated $25,000 for the operation of teaching clinics and $25,000 for the teaching of preventive medicine in the undergraduate and graduate schools of medicine. The General Education Board gave $45,000 for the departments of medicine and surgery. Five thousand dollars was received from an anonymous donor for clinical instruction in the department of surgery.

Through the aid of the C. W. A. medical students were employed to prepare anatomical charts.

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University of Cincinnati College of Medicine

Dr. Edwin R. LeCount, professor of pathology, Rush Medical College, has received the 1934 James E. Stacy Award for "his experimental studies on the isolation of streptococci from sore throats and the experimental induction, through their injection, of acute, healing and scarring types of nephritis, identical with the chronic nephritides observed in man." The award consists of a medal and a sum of money and is bestowed for "significant contribution to the theory of focal infection in theory or practice."

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McGill University Faculty of Medicine

Dr. S. E. Whitnall, Robert Reford professor of anatomy, has resigned to accept the professorship in anatomy at the University of Bristol, England.

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University of Michigan Medical School

PROMOTIONS: Dr. John Morris Dorsey, associate professor of psychiatry; Dr. Cameron Haight, assistant professor of surgery; Dr. Harold William Jacox and Dr. Vincent C. Johnson, assistant professor of roentgenology; Dr. Edgar A. Kahn and Dr. Eugene Breckenridge Potter, associate professor of surgery; Dr. Konstantin Lowenberg, assistant professor of neuropathology in psychiatry.

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University of Nebraska College of Medicine

The obstetric department has created an Oliver Wendell Holmes trophy to be

awarded annually to the councilor district showing the best record in obstetric mortality.

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University of Illinois
College of Medicine

Dr. Francis L. Lederer, who has been associate professor and acting head of the department of rhinology, laryngology and otology, has been appointed professor and head of the department to succeed Dr. Norval H. Pierce, who is now professor emeritus.

Dr. Haim I. Davis, professor of psychiatry, will become professor emeritus September 1, but will continue teaching.

Dr. Arvid Wallgren, professor of pediatrics in the Children's Hospital, Gottenburg, Sweden, delivered the Theodore B. Sachs lectures on tuberculosis.

Dr. Ernest Gellhorn, professor of physiology, was awarded the Alvarenga Prize for 1934, by the College of Physicians of Philadelphia for his studies on parathormone.

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University of Oklahoma
School of Medicine

Dr. Rufus Quitman Goodwin was recently promoted to assistant professor of medicine. Dr. Raymond Lester Murdock to associate professor of surgery, and Dr. Herbert Dale Collins to assistant professor of surgery.

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Boston University
School of Medicine

Dr. Winfred Overholser, assistant professor of psychiatry and assistant commissioner in the state department of mental diseases, has been appointed commissioner of mental diseases.

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Yale University
School of Medicine

Dr. Leonard Greenburg, assistant clinical professor of public health, has been appointed acting health officer of New Haven.

Indiana University
School of Medicine

The departments of occupational and physical therapy have been combined.

The Medical Center Library has received a gift of thirteen medical books written from seventy-five to one hundred years ago.

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College of Medical Evangelists

A department of cultural and legal medicine has been created. Dr. Percy Tilson Magan, professor of public health, has been appointed to head the new department.

Dr. Ragan has also been appointed editor of *Health*, a magazine for the laity, published by the Adventists.

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Stanford University
School of Medicine

Dr. Alfred B. Spalding, for many years professor and head of the department of obstetrics and gynecology, has been made emeritus professor.

Dr. Frank H. Roden has been promoted to assistant clinical professor of surgery (ophthalmology), and Dr. Dohrmann K. Pischel has been appointed associate clinical professor in the same department.

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Albany Medical College

Dr. Arthur W. Wright has been appointed professor and head of the department of pathology to succeed Dr. Victor C. Jacobson who resigned.

Drs. Henrietta C. Horner, associate professor of neuropathology, and Ada Hazel Curry, assistant professors of bacteriology, have also resigned.

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University of Alabama
School of Medicine

Dr. John Howard Ferguson, recently of Yale University, has been named assistant professor of physiology and pharmacology, succeeding Dr. Gene H. Kistler, who is transferring to the depart-

ment of pathology and bacteriology as associate professor. Albert Sydney Harris, Ph.D., Banks, has been appointed instructor in physiology and pharmacology.

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Columbia University College of Physicians and Surgeons

Dr. Willard Cole Rappleye, dean, has been appointed dean also of the School of Dental and Oral Surgery, effective July 1. He has been acting dean of the dental school during the absence on leave of Dr. Alfred Owre, who has now resigned.

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Medical College of South Carolina

Faculty changes: Dr. Archibald E. Baker, emeritus professor of gynecology; Dr. Hillyer Rudisil, Jr., professor of roentgenology; Dr. Joseph Sumter Rhame, associate professor of surgery; Dr. F. Adelbert Hoshall, assistant professor of orthopedics.

The Ravenel award, a silver cup, was given to Dr. William Townsend Barron Jr. of the graduating class for his essay on "Selective Sterilization." This award was established by Dr. Mazyck P. Ravenel, now of Columbia, Mo., in memory of members of the Ravenel family who have contributed to medicine and science in South Carolina.

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University of Minnesota Graduate School of Medicine

Dr. Harry Lee Parker has resigned his post as associate professor of neurology in The Mayo Foundation and consulting physician in the Section of Neurology of The Mayo Clinic to return to Ireland where he has been appointed chief of staff of the Neurologic Institute of Southern Ireland and professor of neurology, Trinity College, University of Dublin. Dr. Parker is a graduate of the University of Dublin and came to the Mayo Foundation in 1919.

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University of Manitoba Medical College

A clinical week was held to commemorate the fiftieth anniversary of the founding of the college. The Gordon Bell Memorial Lecture was delivered by Dr. Wm. L. Boyd, professor of pathology. His subject was, "Growth—Normal and Abnormal." Many distinguished teachers in other medical schools attended the meeting.

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Marquette University School of Medicine

Sir Henry Wellcome, head of the Wellcome Research Foundations of London, England, was granted the degree of Doctor of Science at the annual Commencement Exercises of Marquette University on June 13, 1934.

Sir Henry Wellcome is a native of Wisconsin. He was born at Almond, Portage County, Wisconsin.

Mrs. Eugenia Long Harper gave a lecture April 30 before the honorary medical student society, "The Circle," on "My Father, Crawford Long, the Discoverer of Ether Anesthesia in 1842."

Dr. William Allen Pusey, past president of the American Medical Association, addressed the student body recently. The title of the lecture was "Medicine and Culture."

General News

Medical Library Association

The following resolutions were adopted at the annual meeting held in Baltimore, May 22, 1934.

BE IT RESOLVED: That the Medical Library Association agrees to extend the six months period for reconstruction granted in Chicago, October, 1933, to Dr. Springer and other German publishers to the period of one year, ending November 1, 1934, so that Dr. Springer and the other German publishers be given time to complete their publication programs.

BE IT FURTHER RESOLVED: That the Medical Library Association extend a formal resolution of thanks and appreciation to all of the German Societies and publishers, who have cooperated with it in an endeavor to obtain equitable prices for scientific publications.

BE IT FURTHER RESOLVED: That members of the Börsenverein be advised that after December, 1934, the budgets of Medical libraries can no longer maintain subscriptions to the more expensive journals which still cost $40.00 a year or more. It is the opinion of this association that unless prices can be sufficiently lowered such journals will ultimately only be available in zone libraries. The Medical Library Association desires that its special committee continue a careful study of prices and that the Committee report all additional reductions on German publications beyond those already given as list prices for 1934 to libraries, so that they may be informed at once of any additional help being given by the German group.

It is the opinion of this Association that the Committee suggest to all publishers and editors the necessity for careful editorial selections, and the importance of making every effort to maintain low prices for scientific publications in all countries.

BE IT FURTHER RESOLVED: That the scope of the Committee's activities be extended so that any necessary aid can be given to Mr. Alfred L. Robert in his work regarding the simplification of titles of medical periodicals, the standardization of their volume numbering, and the elimination of the use of Roman numerals.

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Institute of Parasitology of MacDonald College

MacDonald College, Ste Anne de Bellevue, Province of Quebec, Canada, recently dedicated officially the only institute in the world built especially for the study of animal parasites. The Quebec government provided the building. The National Research Council will maintain the institute.

A portion of the building has been in operation for some time, and has been drawing its research material from stock maintained locally, from collectors stationed in every province, including the Northwest Territories situated within the Arctic Circle, from the Quebec Zoological Gardens, and from individual naturalists, stock owners and others throughout the Dominion and in the West Indies, as well as from other parts of the Empire.

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Cancer Research at Hebrew University

A fund of about $200,000 has been created by anonymous donors to establish and maintain a department for cancer research. Study will be directed first toward radiology, physiologic chemistry and the study of cells and tissues. Dr. Ludwig Halberstaedter, formerly of the staff of the Cancer Institute of Berlin, now with the Rothschild Hadassah Hos-

pital in Jerusalem, has been appointed head of the department of radiology; Dr. Georg Goldhaber, formerly Dr. Halberstaedter's assistant, as his assistant in the new department; Dr. H. A. Krebs, formerly of Berlin and now at Cambridge University, England, as head of the department of physiologic chemistry, and Dr. Leonid Doljansky, formerly of the Institute of Pathology, University of Berlin, and now at the University of Copenhagen, as head of the new department to be devoted to tissue culture research and morbid anatomy.

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Middlesex Hospital, London

A gift of 15,000 pounds has been received to found a clinical research unit, to be under the direction of the council of Middlesex Hospital Medical School and for the intensive and exclusive investigation of such diseases as may be selected from time to time.

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University of Birmingham

A department of industrial hygiene and medicine will be opened in October to undertake research in the application of medicine to industry and to offer special training to physicians now connected with industry or wishing to apply for such positions.

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Alberta (Canada) Scholarships

The College of Physicians and Surgeons of Alberta, the licensing body for that province, annually makes grants for five scholarships to medical students in the University of Alberta who have done meritorious work in course.

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Interns in New York Organize

Interns of several hospitals have formed the Intern Council of Greater New York for educational advancement and economic welfare of its members. The council is cooperating with the committee on internships and residencies of the New York Academy of Medicine in investigating the educational aspect of the internship and is also interested in compensation, insurance, maintenance and other intern problems.

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Revision of Medical Curriculum in Great Britain

Medical educators in Great Britain have again undertaken to study the medical curriculum. The feeling that the curriculum is much in need of revision is strong. Previous studies of it have been made. The one by Sir George Newman, made several years ago, is well remembered. Now, the General Medical Council of Great Britain has appointed a committee to make a serious study of the curriculum with the view of elaborating a course of study which more nearly meets present needs, both in education and practice, than the one now in force. The members of this committee are: the chairman of each of the three standing committees of the Council—education, examination and public health—Professor Leathers, Professor Stopford and Sir George Newman, respectively, Dr. Tidy, chairman of the general committee, Mr. Dain, Mr. Gamgee and Mr. Johnstone. Sir Norman Walker, president of the General Medical Council, is ex officio member of the committee.

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Council on Medical Education and Hospitals

Dr. W. L. Bierring, president of the American Medical Association, has appointed on the Council on Medical Education and Hospitals Dr. Fred T. Moore, Des Moines, Iowa, and Dr. John H. Musser, New Orleans, to succeed Dr. James S. McLester, president-elect, and Dr. Emmett North, whose term expired.

Book News

An Introduction to Practical Bacteriology

By T. J. Mackie, M. D., D. P. H.; Professor of Bacteriology, University of Edinburgh, and J. E. McCartney, M. D., Director of Research and Pathological Services London County Council. 4th Ed. William Wood & Company, Baltimore. 1934. Price, $4.

A small handy volume, printed in large, easily read type on a non-glare paper. Subject matter is divided into three parts: the first part is introductory and deals briefly and in a general way with the biology of micro-organisms and with immunity in relation to practical bacteriology; the second, is devoted to bacteriological technic; in the third part, the pathogenic and commensal micro-organisms are described, along with methods of bacteriological diagnosis of the various infections. This part also includes a chapter on the viruses. Illustrations have been omitted as the book is intended primarily as a guide to be used in the laboratory where actual apparatus, preparations and other materials are available as real illustrations of practical instruction. A good book for the beginner in the subject.

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Textbook of Pharmacology and Therapeutics

By Arthur R. Cushny, late professor of Materia Medica and Pharmacology, University of Edinburgh. 10th Ed. Revised by C. W. Edmunds, professor of Materia Medica and Therapeutics, University of Michigan, and J. A. Gunn, professor of Pharmacology, University of Oxford. Lea & Febiger, Philadelphia. 1934. Price, $6.50.

With the many changes that have been made, the work is now in line with the current Pharmacopœias of the United States and Great Britain. Additions and modifications necessitated by new knowledge include the chemistry and biological importance of vitamins, the place of bismuth in the treatment of syphilis, and the chemistry of digitalis. The section on iron has been largely rewritten, new sections have been added on liver and stomach preparations for the treatment of primary anemia, and new hypnotic agents are included. The sections on the "therapeutic uses" of drugs now immediately follow the discussion of their pharmacological action, and are succeeded by a list of preparations to be employed.

This edition includes for the first time a biographical note of the author, "lest an oncoming generation of students and practitioners may forget that the Man was greater than the Book."

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Diseases Peculiar to Civilized Man Clinical Management and Surgical Treatment

By George Crile, M. D. The Macmillan Company, New York. 1934. Price, $5.

The theme is presented that certain diseases, such as neurocirculatory asthenia, hyperthyroidism, peptic ulcer, diabetes and epilepsy are related diseases and result from the tension of highly civilized life which causes a disturbance of the glandular and autonomic nervous system, particularly the adrenal glands. The subject matter is presented from its embryological, physiological, clinical and therapeutic aspects. The author contends that removal of part of the adrenal glands or destroying the sympathetic nerves about them will cure these diseases. He describes an operation for carrying out this procedure, cites many case histories illustrative of the various

diseases named above in which the "dekineticizing" operation was performed.

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Medical and Orthopedic Management of Chronic Arthritis

By Ralph Pemberton, professor of medicine, University of Pennsylvania, and Robert B. Osgood, professor emeritus of orthopedic surgery, Harvard Medical School. The Macmillan Company, New York. 1934. Price, $5.

Based on the conviction that chronic arthritis is largely a preventable and curable disease and intended as a practical exposition of the subject for general practitioners and orthopedic surgeons.

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Textbook of Histology

By Alexander A. Maximow, late professor of anatomy, University of Chicago, and William Bloom, associate professor of anatomy, University of Chicago. 2d Ed. W. B. Saunders Company, Philadelphia. 1934. Price, $7.

Completely revised with many new illustrations. Contains the significant recent findings in histology and histo-physiology. References are included at the end of each chapter. Basic facts and concepts are now in large type and many of the details have been placed in small type. More summaries have been added, and they are supplemented in small type by the conflicting evidence on which they are based. The studies are based entirely on human tissue. The numerous historical references will be appreciated.

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Textbook of Gynecology

By Arthur Hale Curtis, professor and head of the department of gynecology and obstetrics, Northwestern University Medical School. 2d Ed. W. B. Saunders Company, Philadelphia. 1934. Price, $6.

Essentially a record of personal experience presented in a concise form; profusely and well illustrated; with many bibliographic references appended to each chapter. An excellent book for the undergraduate as well as the graduate student.

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Textbook of Bacteriology

By Hans Zinsser, professor of bacteriology and immunology, Harvard University Medical School, and Stanhope Bayne-Jones, Professor of Bacteriology, Yale University Medical School. 7th Ed. D. Appleton-Century Company, New York. 1934. Price, $8.

Rewritten, rearranged and expanded. Chapters on bacteriology of water, milk and soil have been eliminated; the section on pathogenic protozoa has been reduced. Most of the material on technic appears in a special section at the end of the book. Included in this edition are some of the most recent critical summaries of bacteriological knowledge and accounts of discoveries published in late 1933 and early 1934, hence it is up-to-date in every sense of the term. And what a wealth of bibliographic references. These will be of inestimable value to the advanced student.

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Essentials of Physical Diagnosis

By Robert W. Buck, instructor in physical diagnosis, Tufts College Medical School. W. B. Saunders Company, Philadelphia. 1934. Price, $3.

A presentation of the principles of non-instrumental physical examination, a concise description of methods, compressed into a manual. Head, abdomen and extremities are included, as well as constitution and personality of the student. References, including those of historical nature, are appended to each chapter.

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Diseases of the Eye

By Sir John Herbert Parsons, consulting ophthalmic surgeon, University College Hospital (London). 7th Ed. The Macmillan Company, New York, 1934. Price, $5.50.